Regulatory Impact Review/Final Regulatory Flexibility Analysis

Endangered and Threatened Species
Final Rule Governing Take of 14 Threatened Salmon and Steelhead
Evolutionarily Significant Units (ESUs)

June 19, 2000

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Introduction

This document contains the Regulatory Impact Review/Final Regulatory Flexibility Analysis for the Final Rule Governing Take of 14 Threatened Salmon and Steelhead Evolutionarily Significant Units (ESUs) under the Endangered Species Act (ESA). To "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, or collect; or to attempt any of these activities. An ESU is a population or group of populations of salmon that is substantially reproductively isolated from other populations and contributes to the ecological and genetic diversity of the biological species. When defined for a species, an ESU also contains reference to the geographic range of the species. Under §4(d) of the ESA, the Secretary of Commerce (Secretary) is required to adopt such regulations as he deems necessary and advisable for the conservation of species listed as threatened. NMFS now issues a final ESA 4(d) rule adopting regulations necessary and advisable to conserve the fourteen listed threatened salmonid ESUs. Effects resulting from implementation of activities on other listed species (e.g., bull trout) must be addressed through ESA §7 and §10 processes, as appropriate. The rule applies the take prohibitions enumerated in §9(a)(1) of the ESA in most circumstances to one coho salmon ESU, three chinook salmon ESUs, two chum salmon ESUs, one sockeye salmon ESU and seven steelhead ESUs. NMFS does not find it necessary or advisable to apply the take prohibitions to specified categories of activities that contribute to conserving listed salmonids or are governed by a program that adequately limits or minimizes impacts on listed salmonids. The final rule describes 13 such limits (categories of activities) on the application of the take prohibitions.

The Regulatory Flexibility Act (RFA) (5 U.S.C. 601-612) was designed to ensure that agencies carefully assess whether aspects of a proposed regulatory scheme (record keeping, safety requirements, etc.) can be tailored to be less burdensome for small entities (e.g., small businesses, nonprofit organizations, and small governmental jurisdictions) while still achieving the agency's statutory responsibilities. NMFS prepared an initial regulatory flexibility analysis (IRFA) which was made available through the proposed rule. Several public comments were received related to the IRFA or to economic impacts generally. Those comments and NMFS responses to them are summarized in this document. Since the proposed rule was published, NMFS has prepared a Regulatory Impact Review (RIR) assessing the costs, benefits, and regulatory impacts on all entities, not just small entities, and on the public.

Summary of Final Regulatory Flexibility Analysis Findings

This ESA 4(d) rule has no specific requirements for regulatory compliance; it essentially sets an enforceable performance standard (do not take listed fish) that applies to all entities and individuals within the ESU unless that activity is within a carefully circumscribed set of activities on which NMFS proposes not to impose the take prohibitions. Hence, the universe of entities reasonably expected to be directly or indirectly impacted by the prohibition is broad.

The geographic range of these regulations crosses four states and the number of entities potentially affected by imposition of take prohibitions is substantial. Activities potentially

affecting salmonids are those associated with agriculture, forestry, fishing, mining, heavy construction, highway and street construction, logging, wood and paper mills, electric generation services, water transportation, tourism, real estate, and other industries. As many of these activities involve local, state, and Federal oversight, including permitting, governmental activities from the smallest towns or planning units to the largest cities will also be impacted. The activities of some nonprofit organizations will also be affected by these regulations.

NMFS examined in as much detail as practical the potential impact of the regulation on a sector by sector basis. Unavailable or inadequate data leaves a high degree of uncertainty surrounding both the numbers of entities likely to be affected, and the characteristics of any impacts on particular entities. The problem is complicated by differences among entities even in the same sector as to the nature and size of their current operations, contiguity to waterways, the degree to which the operation is already protective of salmonids, and individual strategies for dealing with the take prohibitions.

There are no record keeping or reporting requirements associated with the take prohibition and, therefore, it is not possible to simplify or tailor record keeping or reporting to be less burdensome for small entities. Some limits, for which NMFS has found it not necessary to prohibit take, involve record keeping and/or reporting to support that continuing determination. NMFS has attempted to minimize any burden associated with programs for which the take prohibitions are not enacted. The rule does not duplicate, overlap, or conflict with any other relevant Federal rules.

In formulating this final rule, NMFS considered several alternative approaches, described in more detail in the Final Regulatory Flexibility Analysis (FRFA). These included:

(1) Enacting a "global" protective regulation for threatened species, through which §9 take prohibitions are applied automatically to all threatened species at the time of listing;

(2) ESA 4(d) protective regulations with no limits on the application of the take prohibition, or with few limits on the application of the take prohibition for relatively uncontroversial activities such as fish rescue/salvage;

(3) Take prohibitions in combination with detailed prescriptive requirements applicable to one or more sectors of activity;

(4) ESA 4(d) protective regulations similar to the existing interim 4(d) protective regulations for Southern Oregon/Northern California coast coho, which includes four additional limitations on the extension of the take prohibition, for harvest plans, hatchery plans, scientific research, and habitat restoration projects, when in conformance with specified criteria;

(5) A protective regulation similar to the interim rule, but with recognition of more programs and circumstances in which the application of take prohibitions is not necessary and advisable. That is the approach taken in this proposed rule, which limits the application of the take prohibition on several categories of activities, but would also limit application of the take prohibition for properly screened water diversions, for routine road maintenance, for Portland's Parks and Recreation Department integrated pest management program, for urban density development activities, and for forest management (including timber harvest) in Washington.

For several of these categories (e.g., harvest, artificial propagation, habitat restoration, and urban development) the regulation is structured so that it allows plans or programs developed after promulgation of the rule to be submitted to NMFS for review under the criteria in the rule;

(6) An option earlier advocated by the State of Oregon and others, in which ESA §9 take prohibitions would not be applied to any activity addressed by the Oregon Plan for Salmon and Watersheds, fundamentally deferring protections to the state. At present, NMFS concludes that doing so would not provide sufficient protections to the listed steelhead; and

(7) Enacting no protective regulations for threatened steelhead. That course would leave the ESUs without any protection other than provided by ESA §7 consultations for actions with some Federal nexus. Since NMFS' decision to list the ESUs as threatened, identifying broad segments of human activity as major factors in the decline of these steelhead ESUs, NMFS could not support that approach at this time as being consistent with the obligation to enact such protective regulations as are "necessary and advisable to provide for the conservation of" the listed steelhead.

As a result of comments received related to the proposed rules and IRFAs, NMFS is adopting Alternative 5 described above and has modified the regulations to broaden the applicability of some limits, and to make them more flexible. For instance, the road maintenance limit is now generally available. The limit for development has been broadened to cover a greater range of types of plans or ordinances, and has been modified to allow for circumstances where a jurisdiction's ordinances may not address all of the evaluation criteria, but nonetheless are adequate for a limit for those aspects addressed. These types of adjustments provide additional options for jurisdictions that may wish to proactively seek ESA compliance assurances.

NMFS concludes that at the present time there are no legally viable alternatives to the final rule, as modified from the proposals, that would have less impact on small entities and still fulfill the agency's obligations to protect listed salmonids. The other alternatives may result in unnecessary impacts on economic activity of small entities, given NMFS' judgment that more limited protections would suffice to conserve the species.

Summary of Executive Order 12866 Findings

Recognizing that there may be economic impacts as a result of this rule, NMFS has undertaken an assessment of the costs and benefits of this regulatory action but cannot make a conclusion on whether the benefits outweigh the costs because of a lack of quantitative data. In the past NMFS and the U.S. Department of Fish and Wildlife have generally employed take prohibitions in a blanket fashion. This final rule takes a new approach, identifying numerous limits to those prohibitions. NMFS believes that this rule creates a novel approach to protective measures for threatened species under the ESA consistent with providing maximum opportunity for state and local government to craft locally tailored responses to salmonid protection needs.

NMFS believes that this rule creates a novel approach to protective measures for threatened

species under the ESA consistent with providing maximum opportunity for state and local governments to craft locally tailored responses to salmonid protection needs. The approach will reduce paperwork and regulatory compliance burdens associated with individual §10 incidental take permitting. It will also make better use of scarce Federal resources, by emphasizing programmatic approaches to minimizing take of threatened salmonids. NMFS has now completed a RIR which lays out costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits where estimates cannot be meaningfully made for impacts that are essential to consider.

Although we cannot quantify the economic effect of this rule, given the geographic scope and the size and economic dimensions of the potentially affected economic sectors that operate within the ESUs, we have considered costs and benefits in structuring the rule. While only part of the benefits from recovery of threatened salmonids to a sustainable level would be attributable to this rule, it is widely recognized that recovery would bring major economic and cultural benefits. Thus, the potential costs associated with imposing take prohibitions to protect threatened salmonids are associated with substantial potential tangible and intangible returns.

The ESA limits NMFS to alternatives that lead to recovery, but in choosing among alternatives, we consider taking the least cost path. NMFS has concluded that among the alternative regulatory approaches, the approach in this final rule (with changes made in response to public comment) will maximize net benefits (including potential economic, environmental, public health and safety, and other advantages, distributive impacts; and equity) and minimize costs, within the constraints of the ESA. The chosen alternative recognizes adequate state or local programs by exempting activities that fall within them from the take prohibitions. Under this approach, NMFS involvement will be more collaborative and less often require enforcement actions. This alternative (Alternative 5 described above) has the greatest probability that compliance burdens will be equally shared, that economic incentives will be employed in appropriate cases, and that practical standards adapted to the particular characteristics of a state or region will aid citizens in reducing take in an efficient way. For these reasons, it is likely that this alternative will minimize the economic burden on the public of avoiding take over the long term.

Final Regulatory Flexibility Analysis for the Final Rule Governing Take of 14 Threatened Salmon and Steelhead Evolutionarily Significant Units under the Endangered Species Act

This FRFA consists of the Initial Regulatory Flexibility Analysis for Threatened Chinook, Chum, Coho and Sockeye and the Initial Regulatory Flexibility Act Analysis for Threatened Steelhead (IRFAs) (Appendices I and J), together with the following responses to public comments and an addendum to the IRFAs, in response to comments.

Responses to public comments to the IRFA for Threatened Chinook, Chum, Coho and Sockeye and to the IRFA for Threatened Steelhead

Comment: Several commenters raised issues related to E.O. 12866, and/or stated that NMFS should do a cost/benefit analysis on the rule.

Response: The NMFS has prepared a RIR, which is available on our web site www.nwr.noaa.gov. Some of the comments, however, were based on a misunderstanding of the legal effect of the proposed rules, and were made in the belief that the rules mandated compliance with particular limits. That is not so; the rule does not (for instance) mandate watershed conservation plans. The rule provides a limit on the take prohibitions for watershed conservation plans that meet certain standards, but does not require any person or entity to pursue that limit; they may avoid violating the take prohibition by whatever mechanism they choose.

Comment: NMFS failed to consult with every State and local entity regarding effects of the rules on those entities.

Response: The huge number of such entities within the geographic range covered by this rule makes such consultation far beyond NMFS' resources. However, NMFS held 25 public hearings, accepted comment on the proposed rules for 60 days, and after publication of the proposed rules, held 3 workshops for state and local government officials in Olympia and the Tri-Cities in Washington and in Salem, Oregon.

Comment: One commenter criticized the IRFA prepared by NMFS as inadequate in its analysis of alternatives, and that it "fails to even list" the small businesses related to residential and commercial development in its Table of Sectors.

Response: The proposed rule solicited comments on the scope and comprehensiveness of the IRFA, but comments received did not suggest sources of additional data directly to which NMFS might turn. The IRFA Table of Sectors included Heavy Construction and Highway and Street Construction, which would sweep in a large proportion of the activity related to residential and commercial development. However, NMFS agrees and has developed information on the small businesses related to residential and commercial development-see Addendum below.

Comment: A commenter suggested that analysis of economic impacts should be done by an independent third party and use economic information developed by the Federal Reserve.

Provisions for landowner compensation and exemption from property tax assessments must also be included as part of this rule.

Response: There is no requirement for third party analysis, nor that NMFS utilize information from any particular source in its analyses. In fact, NMFS has searched broadly for economic information that might provide more quantitative estimates of the potential costs of avoiding take. The Federal Reserve does not develop such data. NMFS has no authority to provide for landowner compensation or to alter property tax assessments. One of reasons for the approach taken in this rule is NMFS' hope that by working with local and state government entities toward comprehensive ESA solutions, there will be smaller impacts on individual actors than might accrue from take-avoidance strategies they might otherwise adopt. Also, as is the case for small landowners under the Forests and Fish Report strategy adopted by Washington and recognized in this rule, in some circumstances local or state governments may elect to provide offsetting compensation.

Comment: Several commenters disagreed with aspects of the IRFA prepared for the proposed rules. These included concern that the rule requires extensive reporting and paperwork;

Response: The rule requires only one thing: that actors refrain from taking listed fish. That performance standard does not require reporting. While taking advantage of a limit does require some level of paperwork, that course is not required; an individual or entity may choose simply to modify its actions in a manner that leaves a degree of risk of take that is acceptable to that individual or entity. Nonetheless, NMFS is aware that in some circumstances there will be a paperwork burden, and stands ready to help streamline the process, give technical advice, and in general decrease that burden wherever we can.

Addendum to the Initial Regulatory Flexibility Analyses-Impacts on Small Businesses Related to Residential and Commercial Development

During 1997, approximately 22,000 establishments conducted real estate activities within the ESUs areas associated with this final rule. Almost all establishments employed fewer than 20 employees each, with only six establishments having 500 employees or more. The combined payroll for all of these establishments was approximately $2.8 billion for about 121,000 employees in total. These establishment include firms that are real estate operators and lessors, real estate managers and agents, title abstract offices, subdividers and developers, and cemetery subdividers and developers, and other activities that fall under the Standard Industrial Classification code 6500. These activities will be affected by this rule as state, county, and local governments amend their land use regulations to protect salmonids. These regulations may restrict land use, initiate programs for the purchase of lands important to habitat, and incorporate salmonid issues into permitting processes. In the RIR, the discussion of urban impacts includes descriptions of these types of activities.

Regulatory Flexibility Analysis Conclusion

NMFS concludes that at the present time there are no legally viable alternatives to the final rule, as modified from the proposals, that would have less impact on small entities and still fulfill the agency's obligations to protect listed salmonids. The other alternatives may result in unnecessary impacts on economic activity of small entities, given NMFS' judgment that more limited protections would suffice to conserve the species.

Regulatory Impact Review for the Final Rule Governing Take of 14 Threatened Salmon and Steelhead ESUs under the Endangered Species Act

1. Overview

The analyses that follows was undertaken to meet the requirements of E.O. 12866 (See Appendix A). The analysis is largely qualitative because there is insufficient information upon which to fully quantify the effects of this rule. The types of impacts/considerations associated with steps designed to avoid take in a variety of sectors that are described in the FRFA are expanded upon through a more detailed description of the types of activities that may be affected. (To "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, or collect; or to attempt any of these activities.) Where possible, quantitative information developed in other studies is provided as to activities that will need to be modified to avoid take, potential unit costs of such modifications, and potential benefits that may result from this rule. The analysis concludes by comparing the alternatives based on a number of criteria that address: the probability of recovery, the reduction of individual's uncertainty on whether his activity constitutes a "take," administrative burden, and the flexibility for individuals, governments, and companies to find ways to avoid take and be involved in regulatory decision making. This analysis builds upon the information found in the FRFA.

2. Management Objectives

The objective of these 4(d) regulations is to provide needed protection for 14 ESUs of threatened salmonids in California, Oregon, Washington and Idaho. An ESU is a population or group of populations of salmon that is substantially reproductively isolated from other populations and contributes to the ecological and genetic diversity of the biological species. When defined for a species, an ESU also contains reference to the geographic range of the species Figure 1 displays the geographic extent of the freshwater range of these threatened salmonids, which also utilize vast portions of the Pacific Ocean.

Currently, of 51 ESUs of West Coast salmonids under NMFS' jurisdiction, 25 are listed as threatened or endangered. At a finer scale, at least 106 major populations of salmon and steelhead on the West Coast have been extirpated, a number which would be higher if counting populations in smaller tributaries. (Nehlson et al. 1991)

NMFS has the responsibility to implement the ESA for most marine species, including anadromous species such as salmonids. The first two purposes of the ESA are to provide "a means whereby the ecosystems upon which [endangered and threatened] species depend may be conserved" and "a program for the conservation of such ... species." 16 USC Sec. 1531(b). The ultimate goal of ESA management for all species is to bring listed species and their habitat back to population levels and characteristics that make the protections of ESA unnecessary, so that ESUs may be delisted.

National Marine Fisheries Service

Section 9 and Section 4(d) Coverages

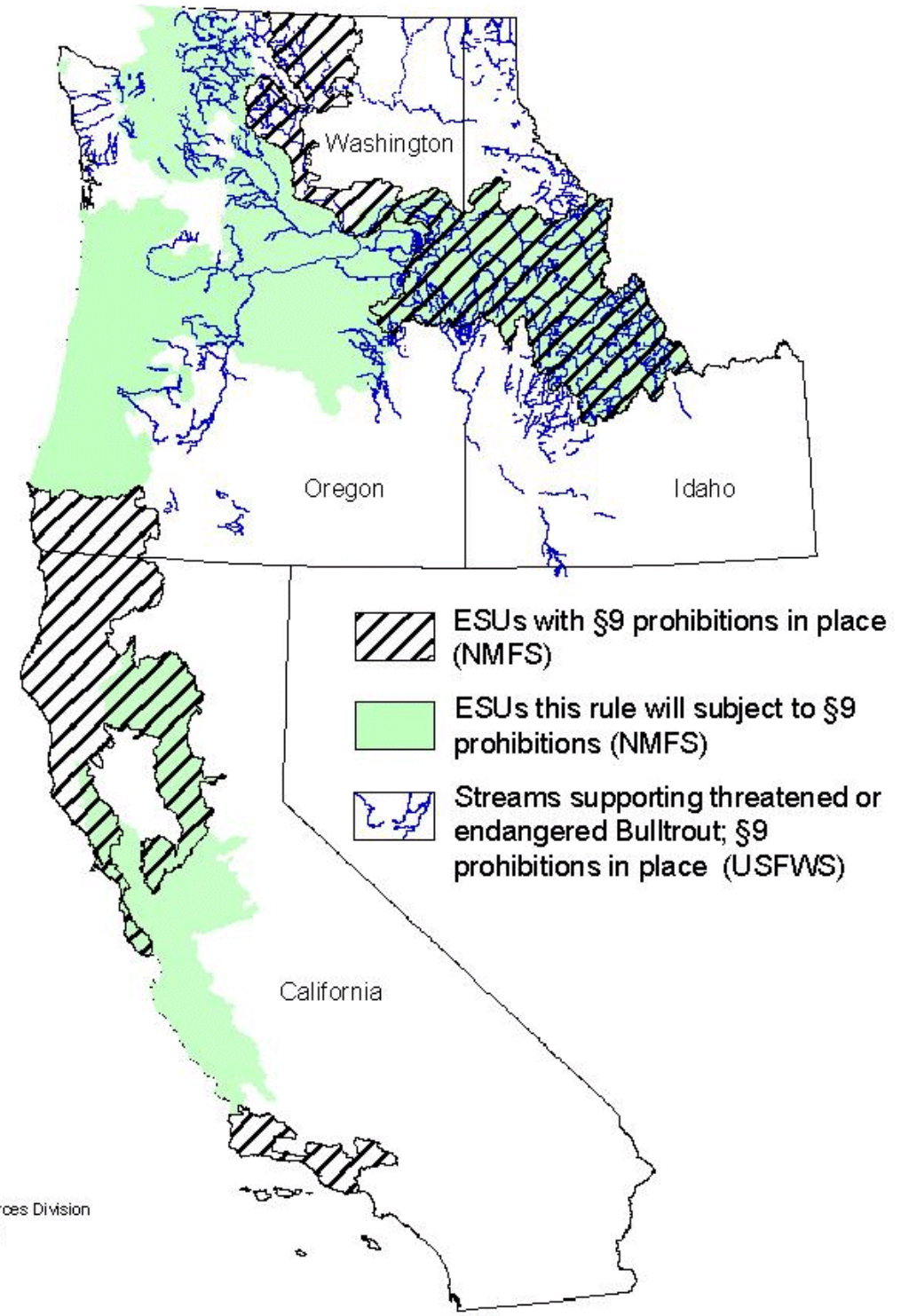

Figure 1.
Protected Resources Division
Portland, Oregon
May 3, 2000

In addition to the mandates of the ESA, the Federal government has trust responsibilities and treaty obligations to Indian tribes with respect to their treaty fishing and other tribal rights, which in the Northwest are inextricably entwined with the health of salmon populations. Historically and traditionally, salmon populations and salmon harvest has been a central feature of tribal culture, religion, and sustenance across the Northwest and in Northern California. The combination of commercial harvest impacts, habitat loss and degradation, hatchery pressures, and other impacts have decimated salmonid populations, and in some cases resulted in extinction. The importance to tribes of recovering salmonids to some semblance of their former abundance cannot be overstated. Harvests that tribes had maintained over many generations dropped precipitously through the late 19th and early 20th century, and have remained at those low levels or much lower. In 1974 the courts upheld the Indians' right to fish, finding that the treaties entitled the Indians to half the harvestable surplus. As salmon and steelhead runs dwindle, it becomes increasingly difficult to meet treaty obligations to Northwest Indians tribes. NMFS' efforts to protect listed salmonids and work toward their recovery and delisting are in keeping with the trust responsibility to Indian tribes' treaty and Executive Order rights and tribal interests in salmonid recovery.

Given increasing pressures of population growth and development, any recovery steps or strategies NMFS and other agencies may launch would be undercut, unless adequate 4(d) protections slow or stop the impairment of habitat function and other impacts on listed fish due to a broad spectrum of human actions. There is widespread public support throughout the Northwest and Pacific Coast areas for recovering threatened and endangered salmonids. As stated by the Oregon Business Council in its 1996 A New Vision for Pacific Salmon:

> "... the strong interest in the salmon cannot be explained by economic measures alone. The Pacific salmon are an important part of the evolutionary and cultural heritage of the northwest. Local communities invest a lot of pride in 'their salmon run' and are increasingly coming together to implement grass roots restoration programs. The salmon have become a rallying point that is reviving the spirit of the community. People who stand little chance of gaining financially from the salmon support the expenditure of funds to prevent their extinction."

3. Problem Statement

NMFS has identified 51 West Coast salmonid ESUs currently under its jurisdiction, of which 25 have now been listed as either endangered or threatened. And, many ESUs formerly existing are now extinct. Numbers have plummeted. For instance, Lower Columbia Chum are at 1% of their historic abundance and many other ESUs are similarly impacted.

When a species is listed under the ESA as endangered, the Act automatically prohibits take of the listed fish. For threatened species, §4(d) of the ESA provides that whenever a species is listed as threatened, the Secretary shall issue such regulations as he deems necessary and advisable to provide for the conservation of the species. Such protective regulations may include any or all of

the prohibitions that apply automatically to protect endangered species under ESA §9(a). Those §9(a) prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take, harass, harm, pursue, hunt, shoot, wound, kill, trap, or collect; or to attempt any of these), unless with written authorization for incidental take. Fourteen West Coast salmonid ESUs, all listed since 1997, will receive protections from this 4(d) rule.

Whether take prohibitions or other protective regulations are necessary and advisable is in large part dependent upon the biological status of the species and potential impacts of various activities on the species. The threatened steelhead and salmon have survived for thousands of years through cycles in ocean conditions and weather. NMFS has concluded that threatened salmon and steelhead are at risk of extinction primarily because their populations have been reduced by human "take." West Coast salmonid populations have been depleted by take resulting from harvest, past and ongoing destruction of freshwater and estuarine habitat from both upland and riparian actions, poor hatchery practices, hydropower development, and other causes. In its report on factors for decline of West Coast steelhead, NMFS concluded that all of these factors have played some role in the decline of the species. (NMFS, 1996). The report identifies destruction and modification of habitat, overharvest for recreational purposes, and other natural and human-made factors as being the primary reasons for the decline. Similar conclusions for other ESUs, with added emphasis on commercial harvest impacts, are supported by the information in coho and chinook factors for decline reports. (NMFS 1997, NMFS 1998). The "ManTech" report describes in detail the impacts of human activities on watershed and instream processes, in the context of habitat requirements of salmonid life stages. (Spence et al. 1996).

4. Management Alternatives

Alternative 1 – No action: When a species is listed, §7 of the ESA requires that Federal agencies consult with NMFS before undertaking any action (project, permit or funding). That mechanism provides broad protections for salmonids and salmonid habitat in the geographic reach of Federal ownership, and more diffuse protections for actions subject to Federal consultation because of Federal funding or permitting. For example, activities requiring U.S. Army Corps of Engineers §10 permit under the Rivers and Harbors Act may require consultation with NMFS.

The typical pattern for most salmonids is to migrate for hundreds of miles to the sea as juveniles, disperse widely at sea as they mature, and return to their natal streams as adults intent on spawning. Most West Coast salmonid habitat is not properly functioning and does not support needed productivity of salmonids. Furthermore, in some watersheds there is little or no Federal land, so that any functioning habitat must be protected through private action or through regulation of private activity. The lower gradient portions of many rivers are important for migration, sheltering and (for some salmonids) rearing. Yet almost all of the riparian lands in the lower gradient portions of river systems are in private ownership. Similarly, estuaries are a vital harbor for many juvenile salmonids as they prepare to move to the ocean, but are impacted most by state and private ownership and management decisions. Therefore, not all of the protections

needed for conservation of the listed ESUs can be had purely through controls on Federal activities afforded by §7, and §4(d) protections are (in the words of §4(d)) "necessary and advisable to provide for the conservation" of the listed salmon.

Alternative 1 – Status Quo (No Action):

Because a large proportion of the decline of these 14 ESUs must be attributed to human activity not associated with Federal land management, Federal permitting, or Federal funding, a "no action alternative" (meaning no 4(d) rule, no take prohibitions) would not satisfy the statutory command to provide whatever regulation is necessary and advisable to conserve the threatened salmonids. Without 4(d) regulations, habitat degradation would continue at current or (because of increasing population pressures) increased rates. Death and injury of individual fish would continue at deleterious rates due to fisheries and other human actions.

As a result of legal challenges alleging that NMFS had unreasonably delayed issuing protective regulations for five threatened steelhead ESUs, NMFS is currently under United States District Court Order to take final agency action with respect to the proposed 4(d) regulations for the seven steelhead ESUs no later than June 19, 2000.

There are a number of other possible alternatives to "no action," the feasibility of each depending on what the circumstances and the biological status of the ESUs indicate is "necessary and advisable to provide for the conservation of the species."

Alternative 2 – Blanket Prohibition: Under this alternative NMFS would impose the take prohibitions in a blanket fashion. This is the approach that NMFS and U.S. Fish and Wildlife typically impose for threatened species. For example, NMFS did so for the first three salmonid ESUs it listed as threatened (Snake River spring/summer chinook, Snake River fall chinook, and Central California Coast coho). For these ESUs, take prohibitions are in effect except for three circumscribed situations: (1) for those operating under a §10 permit or other ESA authorization; (2) for scientific research or enhancement activities for which a permit application has been filed, for a period of up to six months while the permit is processed; and (3) for state and Federal agency personnel who are aiding stranded salmonids or salvaging/disposing of carcasses. These regulations leave the majority of non-Federal actors to assess the risks on their land, production activities, their fisheries, or other undertakings may hold for threatened salmonids, and to determine whether or not they wish to apply for a §10 permit to authorize any incidental take of the listed fish that may occur.

Alternative 3 – Specific Regulation: Under this alternative, NMFS would enact specific proscriptions or regulations, such as those that NMFS put in place for threatened marine turtles [e.g. . . . "it is unlawful for any person ... to ... own, operate, or be on board a vessel, except if that vessel is in compliance with all applicable provisions of §223.206(d)]. 50 CFR 223.205(b)(1). That section lays out in detail the design, mesh sizes, placement and use of turtle excluder devices to be employed with every shrimp trawler net. Specific proscriptions are an

effective protective mechanism where, as with threatened sea turtles, a very specific cause of mortality can be addressed with precision. In the case of Pacific salmonids, where impacts are caused at some level by almost every development or land management action, and where the circumstances leading those impacts to constitute a take are extremely site- or circumstance-specific, NMFS believes that proscriptive regulations would likely impose unnecessary costs on some individuals. That is because with a less prescriptive approach across an entire landscape, state, local or individual strategies for avoiding take can be more closely adapted to the local geography and local circumstances, and thus can be less costly and more effective at avoiding take of the listed species.

Alternative 4--Limited Application of Take Prohibitions (Alternative implemented by this Final Rule): Finally, NMFS would impose the take prohibitions on those sectors of activity which are not otherwise as yet adequately protective of the threatened salmonids, but decline to do so for circumstances where some other program is providing sufficient protections even though there may remain some level of impact on individual members of the ESU. That is the approach selected in this rule. It is necessary and advisable in most circumstances to apply the §9 take prohibitions to these threatened ESUs to provide for their conservation, because a broad spectrum of human activities are not being regulated or conducted in a way that provides adequate protection for listed salmonids. However, where NMFS can identify programs that are adequate to provide reliably for the conservation of the species by that activity sector, NMFS will not impose the take prohibitions. In the words of the regulation, NMFS will "limit" application of the take prohibitions. NMFS believes that this approach is the least intrusive of the available alternatives that will satisfy the statutory mandate to "provide for the conservation of the species," and that this approach allows states, local governments, or individuals to determine whether they wish to have the take prohibition limit in effect for their activity or whether they prefer to proceed in some other way to manage their own risks of take.

A "blanket prohibition" does not guide the individual or entity in how to assure not "taking" salmon. Alternatives 3 and 4, because they do provide specific information/frameworks, do provide the individual with some degree of certainty that he is in compliance with the law. Alternative 3 provides the highest degree of certainty but because it is based on a series of specific regulations also provides the individual with the least flexibility in terms of changing his activity to avoid take. Alternative 4, although it provides less information than under Alternative 3, does provide the individual with more flexibility, thus potentially reducing the attributable compliance burden.

5. Content and Development of the Rule

The rule first and foremost prohibits take of threatened salmonids. That prohibition is the only legally enforceable consequence of the rule. Second, the rule creates a number of "limits" or "exceptions" that describe circumstances or programs for which the take prohibitions will not apply. Finally, the Federal Register notice promulgating the final rule, together with a separately available compliance guides for small entities and others, provides guidance to non-Federal

actors about what activities may carry high risks of take and describes ways of modifying activities to reduce those risks. Through these steps, the rule addresses three connected regulatory features: a) setting performance standards (do not take listed fish); b) identifying programs or standards for programs that do not warrant take prohibitions; and c) effectively streamlining the process by which individuals or entities can obtain assurance that their actions are not in violation of the ESA or its rules.

Take prohibitions will cause individuals and entities to evaluate the risks of take associated with their particular actions, and to modify those actions to reduce that risk. For instance, states authorizing fisheries will design seasons, gear, etc. to avoid impacts on listed fish, resulting in greater juvenile and/or adult survivals. Farmers will avoid allowing livestock or machinery to disturb salmon spawning beds, thus increasing the percentage of fry successfully emerging. Marina owners will avoid creating habitat for predators to shelter in, and take extra steps to prevent use of fuels and solvents from affecting salmonids. Commercial or recreational miners will avoid disturbing spawning gravels, and reduce water quality impacts. Homebuilders will provide riparian protections and avoid impacts of storm water runoff. Agencies and individuals will protect more riparian vegetation, thus moving closer to properly functioning habitat characteristics necessary for recovery of the species. Local jurisdictions will consider the impacts of land use and zoning decisions on salmonid habitat and modify them to reduce detriment to the species. Likewise, state regulatory agencies will take salmonid impacts into account in exercising their regulatory authorities. These are some examples of ways in which the existence of the take prohibition will at least slow the rate at which salmonids are declining, to allow the possibility of successful recovery strategies.

NMFS' approach in this 4(d) rule is to limit application of the take prohibitions (See discussion in §4 above). This approach allows NMFS to target the take prohibitions, avoiding costly redundancy where state or local programs already provide adequate conservation. In this way, NMFS recognizes those programs that are sufficient to support recovery of the listed ESUs, and for which therefore no additional (and potentially burdensome) Federal regulation is necessary. Programs are evaluated for their impacts on the biological status of the species, including application of the concepts of viable salmonid populations and (for habitat) of properly functioning conditions. From NMFS' standpoint, the more local, state or other actions are structured in a manner that makes the take prohibitions unnecessary, the greater the benefit to the listed fish, the smaller the cost and regulatory burden, and the more progress we make toward recovery of threatened Pacific Coast salmonids with its attendant net economic benefits to the region and the nation.

The approach selected in this rule is of interest to many commenters, some of whom urged inclusion of other limits not covered in the proposed rules. NMFS stands ready to work with any and all entities toward developing additional limits or programs to come within current limits.

Some of the limits originated in NMFS' interim 4(d) rule for Southern Oregon Northern California Coast Coho (SONCC), issued July 18, 1997 (62 FR 3879). That rule attempted to

recognize important aspects of a coastal coho restoration initiative spearheaded by Oregon's Governor. Oregon's ongoing effort (now known as the Oregon Plan for Salmon and Watersheds) includes a coordinated scientific monitoring strategy overseen by the state Fish and Wildlife agency; encouragement of habitat restoration and watershed assessment work by local watershed councils, with funding and oversight through the Watershed Enhancement Board; fishery management strategies developed in coordination with NMFS biologists; and standards to govern artificial propagation activities. NMFS recognized those programs that provided sufficient protection for listed coho, by creating "exceptions" to the application of take prohibitions for actions that were in accord with those state programs and any additional requirements listed in the rule.

In this final rule, NMFS applies the take prohibitions generally to 14 threatened ESUs, extends the exceptions (now termed "limits") of the SONCC interim rule to the newly listed ESUs, and creates several additional "limits." Some limits offer the opportunity for programs developed or completed at a later time to come within a "limit" if NMFS finds they meet listed standards in the rule. Other limits are specific to a jurisdiction or circumstance and do not provide for others to take advantage of that limit. However, NMFS expects over time to create additional limits through rule amendment, as other entities develop or help us identify additional, adequate programs not accommodated in the current set of proposed limits. Procedurally, any such alteration of the current proposed action would have to be accompanied by whatever supporting analysis of attributable impacts and effects is required by E.O.12866 and RFA.

The limits included in this rule are similar in concept to the limits that were included in the SONCC rule. During the development of the rule, NMFS met with state and local agencies as broadly as possible, and wherever entities requested a discussion of pending 4(d) regulation. Many of those entities felt they were not in a position to present a completed, fully protective program in the relevant time frame, but expressed interest in being able to submit programs at a later date for ESA recognition through a 4(d) mechanism or otherwise. In other cases, NMFS evaluated agency programs and concluded that they were not yet sufficient to warrant limiting application of the take prohibition, but encouraged continued dialogue and continued improvement of programs for threatened salmonids. As we gain experience with these limits, they may be modified if it can be shown that the necessary conservation benefits can be achieved in ways that reduce the associated regulatory burden.

Following is a brief descriptive list of the most substantive circumstances or programs for which the general take prohibitions will not apply. These limits are discussed in more detail in the Environmental Assessments and in the Initial and Final Regulatory Flexibility Analyses.

- Harvest and artificial propagation (hatchery) activities that comply with the NMFS standards for management plans for artificial production (hatcheries) and for fish harvest activities.
- Joint tribal/state resource management plans when developed and approved within the context of ongoing Federal court jurisdiction.

- Scientific research when permitted through state Fish and Wildlife agencies.
- Habitat restoration actions that are part of overall watershed plans.
- Operation of pumps or other diversion mechanisms when properly screened to prevent injury to or entrainment of listed fish.
- Routine road maintenance conducted in accord with Oregon Department of Transportation's guidance or an equivalent.
- City of Portland's Parks Integrated Pest Management Program.
- City, county or regionally approved development when governed by ordinances that meet 12 standards in the rule.
- Forest activities in Washington under a regulatory program that NMFS deems adequate to protect habitat.

This list over time may be expanded through rule amendments. For example NMFS and others have documented that state forest practice regulatory programs are not adequate to protect habitat functions necessary for salmonids. However, State of Washington, Federal and industry representatives recently forged an integrated regulatory package that NMFS believes provides adequate protections for salmonid habitat. NMFS has therefore proposed to limit application of the take prohibitions where forest management activities are in compliance with regulations under that package. This is a complex package fitted to Washington's specific land use, geologic, hydrologic, climatic and other characteristics. Therefore NMFS has not held this package out as a model or template into which other states should fit their forest practice regulation.

However, whenever another state adopts a regulatory package that provides adequate protections for salmonid habitat, NMFS would intend to limit application of the take prohibitions for forest management activity in compliance with that program through an amendment to this rule. Until then, a forest land owner in Idaho, Oregon or California will need to evaluate the risks their particular forest management activities pose for listed salmonids, and where the risk is substantial, may find it prudent to seek a §10 permit. As indicated above, any such alteration of the current proposed action would have to be accompanied by whatever supporting analysis of attributable impacts and effects is required by E.O.12866 and RFA.

6. General Evaluation Considerations

(a) The Regional Economy: The counties that lie at least partially within the geographic range of the ESUs and adjacent counties potentially affected by this rule have a combined land area of almost 200 thousand square miles, and a population of over 21 million people that earn collectively over $500 billion in personal income. (Table 1). Generally speaking, the economic effects associated with this rule will be associated with those activities that affect the water and land within these ESUs such as agriculture, forestry, and road building, and with recreational fisheries. (Hydro-electric generation activities are subject to ESA §7 consultations and will not be affected by this 4(d) rule.) Some of this activity takes place on Federal lands. (About 45% of the land in California, 52% of the land in Oregon, and 29% of the

land in Washington are Federal). Many retail, wholesale trade activities, and other service activities may not be affected at all by this rule. However either as landowners, consumers or producers, one can presume that the majority of the 21 million citizens that live in these ESUs will have their lives directly or indirectly, positively or negatively, affected as a result of this rule or as a result of other natural resource regulation, including prior imposition of §9 take prohibitions or regulatory steps undertaken to meet the Clean Water Act. Activities on Federal land or that are associated with Federal funding (e.g.,Federal highways) or with Federal permitting (e.g., Army Corps of Engineers 404 permits) will be subject to ESA §7 consultations and will not be affected by this 4(d) rule.

Table 1. Economic Overview of ESUs

	1997 Population 1000's	1994 Personal Income Million $	1990 Land Area 1000 Square Miles
Washington			
State	5610	94420	67
ESU-Counties	4923	75070	42
% State	88%	80%	63%
Oregon			
State	3243	63176	96
ESU-Counties	2856	56424	63
% State	88%	89%	65%
California			
State	32268	702329	156
ESU-Counties	13063	308935	81
% State	40%	44%	52%
Idaho			
State	1210	20703	82
ESU-Counties	144	2644	32
% State	12%	13%	39%
Total ESU-Counties (This Rule)	20986	480556*	218
Of these, Counties with prohibitions already in effect	16477	398874*	168
NET with new take prohibitions	4509	81682*	50

*Adjusted for inflation – 1999$

Note that activities in 77% of those counties are already subject to take prohibitions imposed to

protect other NMFS-listed salmonids, or imposed by the United States Fish and Wildlife Service to protect Bull Trout. Therefore, the take prohibitions contained in this action will have very little impact in those counties as to development or land management activities, which are already constrained to protect important habitat characteristics of salmonid streams. See also Figure 1, which displays the overlaps.

(b) Individual Decision Making: To evaluate economic effects of the alternatives considered, we must be able to determine the options that an individual entity can pursue and then determine what option the individual is likely to choose. Once take prohibitions are in effect, the individual must review his activity and ask the question: "Am I likely to 'take' salmon?" If the answer is no, then she need do nothing more and is not impacted by this rule. If the answer is yes, then the individual can react in the following ways: (1) continue the current activity and potentially violate the rule; (2) stop the activity; (3) modify the activity in a way that eliminates the "take"; (4) apply for an ESA §10 "incidental take" permit; or (5) assure the activity is within a limit described in this rule (currently, or with future amendments adding limits).

(c) Theory of Assessments –Role of Benefit-Cost Analysis: The ESA limits NMFS to alternatives that lead to recovery, but in choosing alternatives, we are obligated to consider taking the least cost path. "Benefit-Cost" analysis is not the criterion for selection of an alternative, but cost-minimization is an economic objective.

To measure benefits and costs of each alternative and then to assess which alternative leads to the highest net benefit, the total economic value of each alternative would have to be measured where total economic value is defined as the sum of direct use value, indirect use value, and existence value (Pearce, 1993). To be complete these values should include uncertainty (i.e., expected value or option price).For example, the direct value of a forest is the amount of timber, non-timber, recreation, medicine, plant genetics, education, and human habitat it provides whereas the indirect value of a forest is the amount of nutrient cycling, watershed protection, air pollution reduction and the micro climate it produces. The option price or value of a forest is the amount individuals are willing to pay to conserve the forest for future use. "Option value is thus like an insurance premium to ensure the supply of something the availability of which would otherwise be uncertain" (Pearce, 1993, p 20). The existence value of a forest is the sum of the amounts individuals are willing to pay over and above their use of the forest because the forest has intrinsic value in itself. (Zerbe/Divley, 1994, p 411.) Motives for existence value are concerns about providing opportunities for future generations (bequest value), providing the forest for use by others (benevolence value), sympathy for the humans, plants and animals associated with the forest (sympathy value), environmental protection (protection value), and to pay for being indirectly responsible for loss of environmental resources (I live in a house, a house uses lumber, lumber production causes loss in environmental resources-environmental responsibility). (Per-Olov Johansson, 1993, p 36.) Because these activities also involve a significant amount of governmental resources (Federal, state, and local), estimates of total economic value would also have to be adjusted by subtracting out administrative and

enforcement costs.

Table 2 outlines major components that should be addressed, but a lack of sufficient information, and empirical data makes it difficult to complete a comprehensive analysis.

Table 2. Taxonomy of Benefit-Cost, Economic Impact, and other Considerations (*Entities and effects for which economic impacts should be analyzed.)*

1.	**Direct Use**	Agriculture Agricultural services Forestry Fishing Other–See FRFA
2.	**Indirect Use**	Nutrient cycling Watershed protection Air quality Micro-climate Water quality
3.	**Passive-Use Values**	Existence values Other values
4.	**Governmental Resources**	State Local Federal
5.	**Distributional Issues**	Tribal Urban growth Rural development
6.	**Resource Protection Issues**	ESA listed species Other species of fish and wildlife Clean Water Act

To quantify the benefits and costs of this rule, specific information on the transmission of economic effects would need to be available. The transmission of economic effects can be described in the following manner:

> Individual Y changes activity X (such as fish harvest or land management) to avoid take. As a result, individual Y incurs either increased costs of production or decreased output or both. However Y's change in activity does increase the probability of salmonid recovery. In the long run, these increased costs and decreases in output will be mitigated for by technology and innovation.

Note that the benefits of recovery may not accrue to the same individuals who incurred the losses. Society will ultimately experience a "net" welfare gain, although there may be distributional effects.

Thus, to assess the total effects of a no-take prohibition would require specific knowledge of how all activities would be changed in the ESUs, by whom, and what the contribution of these activities are to salmonid recovery. For example, Farmer Y believes he may be "taking" salmon. He puts in place a buffer zone between his tilled land and the adjacent salmon stream while reducing the amount of pesticide, fertilizer, and water used. Consequently, all else equal, he will have less output from his farm. Production costs may increase if he seeks other means than through the use of these inputs (e.g, pesticides, fertilizers) to maximize his yield. Alternatively, his costs may decrease if he chooses not to strive to increase the productivity of his remaining acreage and thus simply uses fewer inputs (e.g., pesticides, fertilizers, and water). Consequently, in the short run, we would expect to see Farmer Y's annual output decrease but it is unknown if his costs of production will increase or decrease. In the long-run, Farmer Y is likely to find ways to adapt by changing crops, or discovering better ways of pest protection, fertilization, or using water. Therefore, in the long-run, the annual economic effects of protecting salmon should be less than those estimated in the short run, once these adaptions are accounted for but still may be large.

However, we do not know how many farmers currently are in the position of having to alter their activities to avoid take of salmonids. Nor do we know what specific activities will be implemented by those who want to avoid take.

(d) Some Impacts are Positive: In "Saving Salmon, Saving Money: Innovative Business Leadership in the Pacific Northwest", a recently published study, the authors state in their introduction that businesses can find ways of reducing the initial impacts of environmental regulation:

> "As the Pacific Northwest faces the new millennium, the struggle to preserve our natural environment in the face of swelling population and robust economic growth appears daunting. There is great concern, especially with the recent ESA listing of endangered salmon, that action to reduce environmental impacts on streams, water quality, and salmon habitat will present major economic costs to companies, communities and society. However, over the last few years, a large number of businesses in Oregon and Washington, often in partnership with government agencies, have been quietly saving money while at the same time helping to preserve the environment.
>
> "This report documents that 375 businesses and other organizations in the Pacific Northwest, through aggressive pursuit of environmental efficiency opportunities, have substantially reduced water, energy, hazardous materials and other inputs, reducing pressure on stream habitats and the environment while at the same time saving millions of dollars. These firms are at the leading edge of a movement referred to as "eco-efficiency", creating a more economically and environmentally efficient economy through incremental improvements in resource use and environmental impact. They demonstrate that while there will always be initial investment costs, in both the short and the long term there are often much larger economic savings from efforts to reduce

environmental impacts to conserve streams, salmon, and the environment. In sum, taking steps to restore regional environmental quality can produce significant economic benefits—not major costs—to companies, communities and the region.

"Of the 375 organizations analyzed for this report, data on cost savings were available from 137; these businesses report a combined minimum gross savings of over $42 million from 1992-1999, with most of these savings coming in the last three years...."

When individual Y changes activity X to avoid take, there may be both positive and negative effects on others. For example, changes in timber production practices that improve salmon habitat may positively affect other industries (adapted from ECONorthwest "Salmon, Timber, and the Economy-November 1999, Figure 4.2 . See also Appendix B.):

Recreational Fishing - increased harvests via habitat effects on fish populations
Commercial Fishing - increased harvests via habitat effects on fish populations
Navigation - via sediment discharge that leads to reduction in dredging activities
Municipal Water - via sediment discharge that leads to reduction in water treatment
Property Owners - via habitat effects and sediment effects that lead to reduction in flooding
Water-dependent Industries - via effects on water quality that leads to decreased costs of production
Public - via ecosystem effects that leads to reduction in taxpayer costs for habitat restoration
Tourism - via habitat effects that enhance or increase the supply of recreational opportunities
Public - via habitat effects that increase consumption amenities and therefore, increase the "quality of life"
Employment and Growth - via habitat effects that increase the quality of life and makes it easier to attract new employees or businesses

(e) Cause and Effect is Bound up in Other Regulatory Programs: The following questions were used in the FRFA in connection with estimating the economic effects on businesses, and are appropriate as well for estimation of overall benefits and costs. Questions 2-6 help determine the environmental baseline situation. Questions 4-6 in particular highlight the close relationship between other regulatory programs and impacts of any ESA take prohibitions. Questions 7-11 then help determine the incremental impacts of this salmonid regulation relative to the impacts already accounted for in the baseline:

1. What are the regulations?
2. What entities need to be in compliance with these regulations?
3. How many entities are already in compliance?
4. How many entities would be in compliance if current laws and regulations such as the Clean Water Act were enforced?

5. How many entities would be in compliance as a result of the current and future §7 consultations and other exceptions envisioned by these regulations?
6. How many entities are already in areas subject to the rules and regulations of previous
7. Given the answers to questions 2-6, what entities remain?
8. Entities in this group are the entities potentially impacted by this rule.
9. What activities do these impacted entities have to curtail, modify, or undertake to be in compliance with these regulations?
10. What will be the impacts of these activities on the entities' costs and revenues?
11. Are these impacts significant?
12. Are there Federal, state, or local programs that may help mitigate these financial impacts?

As noted in the FRFA, the information and analyses needed to measure the impacts of those directly and indirectly affected by the alternatives with any precision are unavailable. Therefore the total economic value of each alternative cannot be estimated. Estimates of existence and other non-use values are also lacking.

Even if data were available to determine the direct use and indirect use effects of each alternative, it would still be difficult to provide estimates of impacts or of the costs or benefits attributable to any of the alternatives. Independent of this rule, activities are now ongoing or being planned that directly or indirectly help conserve salmon. For example, efforts are underway to enforce the Clean Water Act to achieve Federal water quality goals. (Appendix C demonstrates the Environmental Protection Agency's authority and commitment to proceed with regulation of nonpoint sources of pollution that are the dominant water quality problem today.) The adjustments made by farm, forestry and development sectors to comply with Clean Water Act requirements will also address a substantial number of the circumstances that would constitute a high risk of take, and thus will reduce the costs of compliance with this rule. Further, if an activity falls within the scope of another Federal agency it becomes associated with a §7 consultation and costs associated with ESA compliance would not be attributable to this rule.

Other species in the same geographic area as affected by this rule, such as threatened bull trout, will also need to be recovered and are already protected by §9 prohibitions. As noted above, this rule will have relatively little impact with respect to land management and development activity in 77% of the counties to which it applies, because in those counties take prohibitions have already been promulgated to protect other salmonid species. (See Table 1 and Figure 1) As a result, states and local governments are already taking steps to limit or shape urban growth or to recover salmon. Therefore, to attribute the costs and benefits and the impacts of the proposed alternatives, we would have to determine how each alternative changes these efforts. It is, therefore, the case that disentangling the economic impacts associated with each individual action (e.g., the proposed alternatives under consideration here), from those more appropriately attributed to one or more of the other regulatory actions cited above, is effectively impossible.

In a very real sense, the benefits and costs of this rule are but a subset of the benefits and costs of implementing a comprehensive recovery plan, which will set out methods to greatly decrease negative impacts on listed salmonids and to increase the amount of properly functioning habitat such that threatened and endangered species can be recovered and "delisted." The next two sections (Economic Costs of the Take Prohibition on Major Sectors and Value of Recovering the Species) provide information that reflect the potential benefits and the costs of recovery. The major limitations concerning the application of formal benefit-cost analysis were discussed above. However, the reader should note that the information presented below concerning the costs and benefits of the rule are from different perspectives. The costs are described from a current, localized and industry perspectives while the benefits are described from a future total regionwide perspective. For example, the unit costs of fencing that farmers that operate in the ESU may have to soon incur are described. In contrast, information is presented on the coastwide benefits to commercial fisheries from recovery. The cost information reflects impacts that are largely independent of other activities while the benefit information reflects impacts that not only depend on habitat restoration on private lands but on federal lands and on changes in other activities such as hydropower, hatchery, and harvest practices. Another contrast between the cost information and the benefit information, is that on a relative basis, in comparison to benefit-related information, total cost and impact information on those user groups affected by this rule is sparse.

The discussion below also mixes information on net economic values (the difference in the change in the total value of the good and services produced minus the change in the opportunity costs resources used up by the activity) with regional impacts (changes in the amount of personal income earned in the Region). Because of lack of good quantifiable estimates, the approach adopted is to use a benefit-cost framework to indicated potential benefits and costs or to indicate changes in human welfare. A formal benefit-cost analysis would only use net economic values in its totaling up the benefits and costs and then use the regional impact information to show how these benefits and costs are distributed. A formal benefit-cost analysis would make assessments based on marginal changes or incremental changes from an activity that results from the rule. The quantitative estimates presented below are typically based on "averages" where the costs or benefits per unit of activity do not vary as the amount of activity varies. For example, such averages would assume that average cost per mile of 100 miles of fencing is equal to the average cost per mile of 100,000 miles of fencing or that each additional fish harvested by a recreational angler would return the same amount of benefit to the angler. A formal benefit-cost analysis would also make a stronger distinction between short run and long run effects. Recovery of many species will take years to accomplish but the information below is based on recent or current averages.

To summarize-what follows is information that sheds some light on the relative costs and benefits of each of the alternatives while expanding on some of the financial impact data that are provided in the associated Regulatory Flexibility Analysis. In the next section, Economic Costs of the Take Prohibition on Major Sectors, three major areas of impacts are discussed: Habitat Modification for Forestry and Agriculture, Urban Effects, and Harvest Effects. The benefits

associated to recreational, commercial and tribal fisheries from recovered species are discussed in the following section, Value of Recovering the Species. Passive use benefits are and distributional issues are also discussed. In lieu of a formal, quantitative benefit-cost analysis, the alternatives are compared on the basis of 12 criteria that reflect administrative costs, the degree of local decision making, probability of compliance and other factors (see Table 11 which is discussed in detail in Section 9). These criteria have economic content and help to demonstrate the differences between the alternatives. They also may suggest which alternatives are more likely to achieve a higher level of "net benefit" to the nation in accord with E.O. 12866.

7. Economic Costs of the Take Prohibition on Major Sectors

Although we cannot quantify the benefits and costs that can be attributed to this rule with any precision, we can glean some insights from published studies. This analysis relies heavily on two studies: The "Human Effects Analysis of the Multi-Species Framework Alternatives" sponsored by the Northwest Power Planning Council and published March, 2000 (NWPPC). The NWPPC analysis contains estimates of the social effects, tribal effects, economic efficiency effects, and regional economic effects for a suite of specifically proposed alternatives that address different policies that address the multiple uses of the Columbia River Basin. These alternatives addressed habitat modification, hatcheries, fish harvest, and hydropower activities. The NWPPC analysis relied heavily on the Army Corps of Engineers multi-million dollar study: "Lower Snake River Juvenile Salmon Migration Feasibility Study" of which there was an Anadromous Fish Economic Analysis. Economic Impacts and Values for Changed Anadromous Fish Harvests due to Lower Snake River Hydrosystem Management Actions and the Economic Impacts and Values for Anadromous Fish Harvests from the Columbia River Basin-Final Draft-October 1999 (Corps). In addition to these studies, other studies will be drawn upon to illustrate the economic effects upon urban, forestry, agriculture, and fisheries activities and to illustrate benefits to the general public. (Appendix D contains excerpts from Congressional testimony on ESA issues . The purpose of these excerpts is to provide further illustration of some of the costs that may result by this rule.)

The geographic focus of both these studies was the Columbia Basin which is dominated by the presence of large dams. The major difference in scope between the NWPPC study and the Corps study was that the NWPPC attempted to analyze alternatives that in addition to treating hydropower alternatives also examined alternatives that addressed habitat modification on forest and agricultural lands within the Columbia Basin. In contrast, this rule affects two other large areas besides the Columbia Basin. These are the Washington State Puget Sound Area and the Steelhead ESU areas found in Central and Northern California. In addition, unlike the Corps study that addresses only Federal activities and unlike the NWPPC study that assessed Federal and non-Federal actions within the Columbia Basin, this rule only examines non-Federal activities that take place largely on non-Federal lands.

(a) Habitat Modification-Agriculture and Forestry: The NWPPC analysis identified the activities that an agricultural or forest operator might modify or undertake to improve habitat

under a suite of proposed alternatives for restoring salmon in the Columbia Basin. Because they represent the types of activities that may be undertaken in response to this rule, they are presented in Tables 3-5. To develop cost estimates the NWPPC made a series of assumptions about the extent of various standard practices for strategies that affect construction or land acquisition; the amount of habitat area affected; the share of area affected that needs no, low, medium, and intensive restoration; and the unit cost of restoration and related these factors to type of land use. Based on these assumptions and depending on the alternative analyzed for the Columbia Basin, these estimates ranged from $39 million to $680 million per year. (These estimates also include estimates of costs associated with urban areas.) In evaluating their Alternative 1 which is different from the Alternative 1 of this analysis, NWPPC stated (pp. 1-7):

> "Under Alternative 1 habitat restoration and protection would be the most extensive of any Framework alternative. Total habitat costs for Alternative 1 are estimated to be $370 million to $680 million annually. This total consists of about $140 million to $300 million for agricultural practices and $70 million to $130 million for forest practices. Most of the reminder is for construction, especially fish screens (about $75 million annually) and land acquisition. By assumption, about one-third of habitat costs would be paid by ratepayers...."

The NWPPC (pp. 4-6) in developing these estimates also states that:

> "The Human Effects Analysis has developed preliminary methods to estimate habitat costs based on typical habitat improvement practices and unit costs of implementing the practices...Data about typical practices and their unit costs were obtained from a variety of sources, especially USDA, BPA, and state governments. For this report, the amount of resource (acres of land, water, miles of stream, amount of construction) affected by each practice is largely assumed because the necessary information from the ecological analysis is not available..."

These costs address activities within the Columbia Basin that fall under §7, as well as non-Federal actions that will be governed by this 4(d) rule. However, the broad geographic area subject to this rule and the general, performance-standard nature of the regulation, make it infeasible to do something similar to the NWPPC study, particularly given the need to have good information that relates land use and habitat improvement practices that are set in to play because of this rule.

TABLE 3. ASSUMPTIONS FOR PRACTICES FOR STRATEGIES THAT AFFECT AGRICULTURAL LAND USE.

Strategy	Descriptor	Assumption on Land Affected	Typical Practices to Implement	Assumption on amount of share of land affected by intensity level	Cost range, $/yr when done
Hab 11.0	Nutrient and pathogen load reduction from grazing agriculture	5% irrigated land and all rangeland	Deferred grazing, planned grazing, proper grazing, grazing land protection	3 = 33 percent, 2 = 10 percent, 1 = 5 percent	$1 - $7 per acre plus $10 per lost Animal Unit Month(AUM)
Hab 14.0	Pesticide reduction	Irrigated and dryland crops	Pest management, pest scouting cost	3 = 33 percent, 2 = 10 percent, 1 = 5 percent	$5 - $10 per acre
Hab 17.0	Reduce grazing impacts to riparian aquatic ecosystem	Livestock on riparian lands	Fencing, livestock wells	3 = 100,000 acres, 2 = 50,000 acres, 1 = 20,000 acres	$3 per ac fences +$10/AUM plus wells, $10 to $20 per ac
Hab 25.0	Groundwater management to maintain flow	Groundwater irrigated crops	Acquire lease options to eliminate groundwater withdrawals for irrigation in dry years, fallow land	3 = 33 percent, 2 = 10 percent, 1 = 5 percent, all in 1 out of 4 years	$100 to $300 per acre
Hab 32.0	Halt new water withdrawal permits	New irrigated crop acreage	We have assumed this will occur as a common assumption		
Hab 33.0	Reduce existing permits for water withdrawal	Surface water irrigated crops	Acquire lease options to eliminate surface water withdrawals for irrigation in dry years, fallow land	3 = 33 percent, 2 = 10 percent, 1 = 5 percent, all in 1 out of 4 years	$100 to $300 per acre
Hab 34.0	Encourage cultivation of less water-intensive crops	Irrigated crops	Pay farmers to switch from higher-using crops (alfalfa, corn) to small grains	3 = 33 percent, 2 = 10 percent, 1 = 5 percent, all in 1 out of 2 years	$50 per acre
Hab 7.0	Agricultural water conservation	Surface water irrigated crops	Irrigation water conservation, irrigation water management	3 = 33 percent, 2 = 10 percent, 1 = 5 percent, in all years	$50 per acre
Hab 8.0	Irrigation waste water treatment	Surface irrigation crops (not sprinkler)	Tailwater recovery	3 = 33 percent, 2 = 10 percent, 1 = 5 percent, in all years	$20-$40 per acre
Hab 19.0	Manage land use and riparian conditions to maintain water quality	Livestock and irrigated crops on riparian lands	Acquire riparian land	3 =100,000 acres, 2= 50,000 acres, 1 = 20,000 acres	$50 to $500 per acre
Hab 37.0	Develop habitats to link terrestrial preserves and refugia	Management	Manage terrestrial lands, convert some ag land to conserving use, ACRES	3=50,000 acres, 2=25,000 acres, 1 =5,000 acres	$20/acre/yr
Hab 38.0	Protect high quality terrestrial habitats while allowing restricted use	Livestock	Lease land, defer grazing	3=1,000,000 acres, 2=500,000 acres, 1= 100,000 acres	$5 to $10/acre/yr
Hab-1.0	Reduce agricultural impacts to riparian aquatic ecosystem	Irrigated crops on riparian lands	Conservation tillage, filter strips, stream protection	3 =100,000 acres, 2= 50,000 acres, 1 = 20,000 acres	$25 to $100 per acre

Source: Sources described in Appendix B of NWPPC.

TABLE 4. ASSUMPTIONS FOR EXTENT OF PRACTICES FOR STRATEGIES THAT AFFECT FORESTRY.

Strategy	Descriptor	Assumption on Land Affected	Typical Practices to Implement	Assumption on maximum amount to share of land affected [1]	Cost range, $/yr when done
Hab 39.0	Limit size and frequency of clearcuts	Land harvested	Limit to 60 acres (FSC recommendation)	All harvested land = 2% of nonfederal	$6 to $70 per acre
Hab 40.0	Normative fire frequency	Forest land	More controlled burn	5 percent of forested acres annually	$25 to $50 per acre
Hab 41.0	Develop normative forest age structure and species composition	Land harvested	Shelterwood harvest method	Half of harvested land (2% nonfederal, 0.3% federal)	$50 per acre harvested, plus interest on 15% of gross
Hab 42.0	Provide gradual forest ecotones	Land harvested	Group selection harvest method	Half of harvested land (2% nonfederal, 0.3% federal)	$100 per acre harvested, plus interest on 25% of gross
Hab 6.0	Reduce forestry impacts to riparian/aquatic ecosystem	Formerly forested riparian areas	Reforestation of riparian areas	Reforestation of riparian areas, maximum 861,307	$300 to $500 per acre

[1] Habitat 39.0 and 6.0 would apply to 100, 50 and 25 percent of maximum land use in intensities 3, 2 and 1, respectively. The other strategies would apply to 33, 10 and 5 percent, respectively.
FSC = Forestry Stewardship Council.

Sources: USDA, 1997; Public Forestry, 1999; Pacific Rivers Council, 1993; Warren, 1999.

TABLE 5. ASSUMPTIONS FOR EXTENT OF PRACTICES FOR STRATEGIES THAT AFFECT CONSTRUCTION OR LAND ACQUISITION.

Strategy	Descriptor	Industry Affected	Practices and Assumption on Amount, UNITS	Cost Range [1]
Hab 9.0	Irrigation withdrawals screening	Surface water diversions	Funding per year, DOLLARS	$77,000,000
Hab 43.0	Reduce forest road density	Road miles	Maximum 10,000 miles of roads, MILES	$1,000 to $1,500/mile/year
Hab 23.0	Tributary wood supply enhancement	Construction	"Knowles Creek strategy" (PRC, 1993), 3,500 MILES	$1,500/mile/year
Hab 35.0	Remove dikes and manage dredging and other measures to restore estuarine habitats	Construction	Lower Columbia River Estuary Program, PROGRAM	Assume current program is doubled to $2,200,000 total
Hyd 11.0	Provide gravel and organic debris in unimpounded mainstem areas	Construction	Trucking and placing gravel, CU YDS	1 million cubic yards annually, $12/yard
Hyd 28.0	Remove bank armoring	Construction	Rip-rap mitigation measures include gravel-covered rip-rap, placement of woody debris, artificial structures, MILES	50 miles annually, $30/foot
Hab 12.0	Obstruction passage improvement	Construction	Remove small dams, weirs, replace culverts, provide fish ladders at economically marginal facilities PROJECTS	3 = 200 more projects, 2 = 100 more projects, 1 = 50 more projects, $5,000 to $50,000 per project year
Hab 18.0	Establish aquatic reserves, preserves, refugia	Acquire land	Land acquisition or lease, riparian and near water ACRES	100,000 acres, $50 to $250/acre/year
Hab 18.1	Establish terrestrial reserves, preserves, refugia	Acquire land	Land acquisition or lease, riparian and upland ACRES	100,000 acres, $25 to $143/acre/year
Hab 27.0	Link terrestrial and aquatic preserves and refugia	Acquire land	Land acquisition or lease, upland ACRES	100,000 acres, $25 to $143/acre/year
Hab 31.0	Active habitat restoration	Construction	Wetland construction, ACRES	200 projects, typical projects are $2,500 to $9,500/year
Hab 4.0	Floodplain corridor reconnection	Construction	Remove levees, restore channels, meanders, ACRES	50,000 acres, $220/acre/year

[1] Intensity levels of 3, 2, and 1 are associated with 100, 50 and 25 percent implementation of maximum levels.

Source: Appendix B, CRA (1989), CBB (1999); see text.

(b) Urban Effects: Information on the costs associated with the 4(d) rule and urban areas is unavailable. However, the types of decisions, activities, and issues can be described. In "Extinction is Not an Option" a report issued by the State of Washington in September 1999, the following described the effects of urbanization:

> "The tremendous population growth experienced by the State in the past 30 years has taken a toll on the state's natural resources. The State Office of Financial Management Forecasting Division estimates show the state's population has grown by 20% every 10 years since the 1960s. It stands now at 5.6 million, and is forecasted to reach 5.9 million in the year 2000 and 7.7 million by 2020. While growth was experienced in many counties in the state, urban counties along Interstate-Five have grown the most, with some counties experiencing up to 33% increase in population between 1990 and 1997. The population increase and associated development have drastically altered many natural habitats critical for salmon survival. Managing growth will continue to be a major challenge facing the state for many years to come.
>
> Urbanization, which occurs when land is developed in both urban and rural areas, starts with forest and farm lands conversion and/or low-density development, and continues with increasing intensities of land use. Many cities and towns were built along rivers and often within floodplains. Urban areas are frequently located in important salmon migration corridors and rearing areas. The areas most significantly affected by urbanization are small streams, riparian corridors and associated wetlands, and shorelines and estuaries.
>
> The impacts occurred mostly in increments, with no single action significant enough to cause any noticeable harm. Early attempts to address public safety and property losses due to flooding by building dikes, storm water retention ponds and other structural solutions were inadequate, costly, and caused widespread environmental problems. For example, levees along rivers have all but eliminated connectivity between rivers and remaining off-channel waters that are important to salmonid rearing, and have increased the speed and volume of run-off.
>
> It's a well-known and documented fact that streams, wetlands, and estuaries are being altered and degraded by urbanization. Scientific information demonstrates that the proportion of streams within urban areas that are degraded is greater than the proportion of altered streams and rivers on agricultural and forest lands.
>
> Between 45% to 62% of Washington's estuarine habitats have been lost to diking, channelization, dredging and filling. We've also lost more than 30% of the original 1.35 million acres of wetlands. More than 90% of the wetlands in urban areas have been lost to development. It's estimated that one-third of Puget Sound's shoreline has been modified by human development with 25% occurring in the intertidal zone. Conversion of forest and agricultural lands, filling, diking, dredging, creation of impervious surfaces (parking lots, roofs, etc.), construction of bulkheads and docks, and introduction of contaminants and exotic

species are some of the primary causes of loss of wetlands and estuarine/nearshore habitats in urbanizing areas.

Sand and gravel mining for road construction, industrial and urban development occurs either in streams or adjacent floodplains. Sand and gravel operations -- dewatering, extraction of the sand and gravel, washing, and processing -- degrade channel conditions (wider and more shallow channels), reduce streamflow and lower ground levels, eliminate gravel needed for spawning, and add sediment and minerals to streams.

Water quality in urbanized streams is highly degraded. Nearly 700 water bodies in Washington State are on a list of those failing to meet water quality or sediment standards. While the list represents only about 2% of the states' waters, most estuaries and river systems in the state are on the list, including those important for salmon. Bacteria, temperature, toxics, dissolved oxygen and acidity are the most common water quality criteria exceeding standards -- all except for bacteria are critical for the survival of salmon and other aquatic life. Most of the pollution comes from point sources that enter the waters from commercial, industrial and municipal discharges and nonpoint sources generally caused by land use activities.

Residential, commercial and/or industrial development changes the natural hydrologic cycle by stripping vegetative cover, removing and destroying native soil structure, modifying surface drainage patterns, and adding impervious and nearly impervious surfaces, such as roads and other compacted soils. Loss of water in stream channels and riparian areas due to water withdrawal and consumptive use of water from streams, rivers and aquifers further reduces groundwater recharge."

For urban areas, the activities to protect salmon proposed by the Puget Sound counties of King, Pearce, and Snohomish in their Tri-County Framework Plan are good examples of what economic activities are likely to be affected. (See also Appendix E-which describes similar activities for Portland.) The Tri-County Plan contains the following:

Improved land use planning and land use regulations
Improved stormwater programs
Protective road maintenance procedures
Acquisition and restoration of habitat
Development of scientific watershed salmon conservation plans
Development of protected or management zones around streams
Improved wastewater operations

The City of Mountlake Terrace, Washington a city of about 21,000 that serves as a northern suburb to Seattle, states in its comments to the "Proposed Tri-County 4(d) Framework Plan, that:

"The underlying theme of the proposal is that implementation of regulations and standards will be left up to local jurisdictions, who will then be required to commit to, and participate financially in, an interlocal agreement that would fund WRIA wide planning. Funding of the

complete suite of efforts required to meet ESA requirements will, of course, be a huge strain on our existing budget. The unanticipated requirements of participation in Tri-County efforts, have been estimated by City Staff to be on the order of $250,000 in one time expenses and as much as $150,000 to $200,000 in annual ongoing expenses. This amount is approximately 20% of our existing stormwater budget.

Financial participation by the City in regional planning efforts, or in regional habitat acquisition and restoration efforts is, therefore, unlikely at this time. Without some general funding mechanism in place to assist local governments with the whole ESA regulatory package, our only option may be to consider putting together our own program and taking our chances under the West Coast 4(d) rule."

In Oregon, Portland Metro's planning efforts illustrates a blending of the alternatives analyzed herein which could only be made possible through the preferred alternative. Metro, the Portland Oregon regional government that serves over 1.3 million people and 24 cities including the urban portions of three counties, is developing a Fish and Wildlife Habitat Protection Plan. (Portland already has an existing Metropolitan Greenspaces Master Plan the purpose of which is to purchase land, provide environmental education, restore habitat, and promote volunteer stewardship.) The Fish and Wildlife Habitat Protection Plan has three options. A community could choose to apply more than one of the options depending on the situation.

Under Metro's Option 1, the Regional Safe Harbor (the base program) offers an objective standards approach. A "safe harbor" means applying one set of standards to an entire area. Under the proposed program, new development and redevelopment along streams would be prohibited within a "regulated area" unless the parcel is entirely or substantially located inside that area. In those instances, limited disturbances in the regulated area will be allowed. The proposed regulated area would be one of three possibilities: 200 feet from top of bank on each side of stream, or up to the top of steep slopes (25% or greater slope) plus 25 feet, or Flood areas (FEMA 100-year floodplain or 1996 flood inundation areas) plus 25 feet,…whichever is the greatest area.

Metro's Option 2, the "local alternatives" option, allows a local jurisdiction to vary from the regional safe harbor on a case-by-case review as long as minimum protection standards for the resource are met. Under Metro Option 3, the "Local Riparian District" option, city, county or property owners define district area and plan, according to pre-determined acceptable standards. It provides local flexibility and creativity for larger areas, particularly for redevelopment to mixed use areas. These plan elements, like the already adopted Stream and Floodplain Protection Plan, will affect new development and redevelopment only. Existing structures will not be affected. Property owners will be encouraged to build outside of regulated areas, but will not be denied an economic use of a property that is completely or mostly within a regulated area.

The Portland Metro plan has associated with it a social and economics effects analysis that shows the trade-offs that have been or will be considered between conflicting land management uses. These are summarized in Appendix F.

(c) Fisheries: There are three major areas of harvest, all of which are generally subject to §7 consultations and will not be affected by this rule. The ocean salmon fisheries are managed by the states of Washington, Oregon, and California and by the Pacific Fishery Management Council. The Puget Sound fisheries are managed by Washington, tribes, and Federally through the Pacific Salmon Treaty. Some of these fish are also taken in Canadian and Alaska. Impacts of the take prohibition, however, will center largely on freshwater tributary or estuary recreational fisheries.

Recreational fisheries that are not subject to §7 requirements are managed under state regulations. Each of the affected states has a long history of fish management, including artificial propagation programs and policies aimed at preserving populations spawned in the wild. State regulation has substantially decreased impacts on wild, listed fish, while allowing fishing for non-listed fish and, recently, for marked hatchery stocks. In some cases the states themselves have provided special protections to one or more of the ESUs through their own listing process or some analogous program. State regulation may be tightened to provide some additional increment of protection for these ESUs after the take prohibition is in place, which may result in a substantial reduction in economic expenditure. The degree of this loss depends on the fishery. For large freshwater fisheries, a moderate reduction in the quota can result in millions of dollars of lost revenue to the economy each year (Hamilton, 2000). Other fisheries will not be directly affected by ESA take prohibitions. Given the substantial reduction in fisheries affecting listed species in recent years, imposing take prohibitions for the listed ESUs is not likely to result in major reductions in economic activity. Regulatory changes made in response to the take prohibitions may require more selective fishing for the harvest of artificially propagated fish only, which can result in greater economic expenditures compared to fisheries which may be of short duration because of limited quotas. (Hamilton, 2000)

The general trend over the last 40 years in California, Washington and Oregon has been an increase in the number of anglers and in expenditures per angler. (USFWS, 1996) In the future, when stocks have rebounded, sport fishing regulations may be relaxed with an expected rebound in sport fishing-related economic expenditures.

(d) Distributional Issues: Information contained in this document and the FRFA shows that many groups (e.g. tribes, fishermen, landowners, farmers, consumers, tourists, manufacturers, etc.) will be impacted positively or negatively (or both) by this rule. Among other things, the amount of the impact depends on the degree to which complying with this 4(d) rule requires steps beyond ongoing requirements of land use planning, adherence to earlier take prohibitions which are already in effect over a large proportion of the lands affected by this rule, compliance with state environmental laws, and Federal laws such as the Clean Water Act, and on social goals of the communities within which these groups reside or work. In addition, the distribution of these impacts will depend on whether tax policy, regulatory policy, and other policies shift the burden to other groups such as Federal and state taxpayers. Finally, as discussed by the NWPPC study (p.2-2), these impacts will vary disproportionately across groups:

> "...Individuals and communities that currently derive benefits from the river system may experience gains or losses if the use of the river system changes. These kinds of costs, although painful, are often temporary. However, these adverse effects are more concentrated

and predictable and thus tend to have a disproportionately greater influence on the policy debate than the potential winners. Beneficial effects of ecological improvements tend to be diffuse and difficult to measure in comparison to the adverse effects."

8. Value of Recovering the Species

While it is not possible to pro-rate the share of benefits of recovery that would be attributable to imposition of the take prohibitions, it is nonetheless worthwhile to set out the general scope of the economic and other values that have been impaired by the decline of West Coast salmonids. Those values will be recouped in part or in whole as those species recover.

(a) Commercial and Recreational Fisheries: Recovered runs would allow some rebound in the harvest economic values (commercial revenues, recreational expenditures and regional impacts), and net economic values associated with commercial and recreational fisheries.

Salmonid fisheries include- recreational, commercial, and tribal harvests. As these fisheries are managed in different ways and by different organizations, it is difficult to compile consistent statistics from secondary sources that can be aggregated across all fisheries. Below is some information on the harvest and economic dimensions of these fisheries. Although in some areas sockeye, pink, and chum salmon are harvested, this analysis focuses on chinook, coho, and where information is available, steelhead because they are the predominant ESU species in the three major areas of harvest. The analysis includes non-listed and listed chinook, coho, and steelhead data because the 4(d) rule will not only aid the recovery of listed species but will also improve the sustainability of the non-listed species. Data from selected years shows trends or rough orders of magnitude of harvest, revenues, or income impacts. These trends illustrate both the magnitude of losses in fishing opportunities due to decline of these species and the potential benefit of recovering listed fish.

Ocean Harvests:--According to various issues of the Pacific Fishery Management Council's "Review of Ocean Salmon Fisheries, there are major commercial troll and recreational ocean salmon fisheries that harvest chinook and coho (Table 6). All of these fisheries show declines since the 1970s. In many instances, 1999 harvests tend to be the lowest on record. In terms of totals, the 1970s and 1980s were periods where millions of individual fish by species were harvested--now harvests are below 500,000 fish by species.

Table 6. Harvest Trends in Ocean Fisheries (1000's of Fish)

	Non-Indian Troll Chinook	Non-Indian Troll Coho	Recreational Chinook	Recreational Coho	Tribal Chinook	Tribal Coho	Total Chinook	Total Coho
Washington								
1950	167	649	6	6			173	655
1960	122	181	89	78			211	259
1970	214	744	161	493	11	9	386	1246
1980	125	392	54	363	15	35	194	790
1990	66	181	30	225	40	91	136	497
1999	45	37	9	40	28	33	82	110
	Tribal:1970 assumed to equal 1972 landings; 1960 Non-Indian Troll unusually low,1959=316;1961=357							
Oregon								
1950	248	356						
1960	128	112	37	228			165	340
1970	165	989	43	257			208	1246
1980	209	122	19	326			228	448
1990	232	122	26	200			258	322
1999	6	0	8	14			14	14
California								0
1950	474	92	120	13			594	105
1960	540	18	120	13			660	31
1970	517	183	148	15			665	198
1980	589	50	85	21			674	71
1990	423	61	140	52			563	113
1999	265	0	88	1			353	1
	Assume-1950=1952		Assume 1962=1962 Assume 1950=1960					
	Total Ocean							
1950	889	1097	6	6	0	0	1015	1116
1960	790	311	246	319	0	0	1036	630
1970	896	1916	352	765	11	9	1259	2690
1980	923	564	158	710	28	35	1109	1309
1990	721	364	196	477	48	91	965	932
1999	316	37	105	55	43	33	464	125
	Tribal ocean harvest insignificant prior to 1970							

Columbia River Harvests – The downward trends in total (Tribal and non-tribal) commercial harvests are even sharper in the Columbia River. (Table 7). Total landings in 1998 are the lowest ever while coho and steelhead are at all time lows. There are also recreational and tribal ceremonial and subsistence fisheries in these waters and trends in these fisheries would be similar.

Table 7. Tribal and Non-Tribal Commercial Harvests (1000's of Fish)

Columbia River							
		Chinook	Coho	Sockeye	Chum	Steelhead	Total
1870		550					
1880		1943					
1890		1230	32	1120		399	
1900		1037	341	257	99	192	1926
1910		1365	524	122	371	51	2433
1920		1676	206	51	105	160	2198
1930		1082	865	192	63	329	2531
1940		685	153	112	103	344	1397
1950		535	117	50	58	116	875
1960		266	18	120	1	92	496
1970		357	536	17	1	33	944
1980		150	150	0	0	7	308
1990		148	76	0	0	33	258
1998		38	24	0	0	5	67
Source:	Status Reports Columbia River Fish Runs and Fisheries, WDFW & ODF&W various issues.						

Puget Sound Harvests -- Again, the pattern in overall landings is downward, with 1999 being the lowest year on record for total landings by species (Table 8).

Table 8. Puget Sound Harvests (1000's of Fish)

	Non-Indian Chinook	Non-Indian Coho	Indian Chinook	Indian Coho	Recreational Chinook	Recreational Coho	Total Chinook	Total Coho
1970	131	435	29	119	226	119	386	673
1980	94	165	481	755	245	118	820	1038
1990	53	391	198	677	126	317	377	1385
1999	10	12	79	103	26	90	115	205
Assume 1970 recreational=1971-75 Average and 1999 recreational=1998 harvest Excludes ceremonial and subsistence harvests Source: PSMFC, 1999, Tables B37 & 38.								

Commercial Ex-Vessel Revenues and Prices--Mirroring the decline in harvests is the decline in revenues (Table 9). Commercial ex-vessel revenues are currently $13 million-one fourth the revenues of 1980 and one sixth of the ex-vessel revenues earned in 1981. This trend is not only

due to declining harvests but to changes in ex-vessel prices which also have fallen significantly because of changes in the market place-such as from increased competition from farmed and Alaska wild fish and from changes in foreign economies.

Table 9. Commercial Landings and Ex-Vessel Revenues of Chinook and Coho.

All Areas-Ocean, Puget Sound, and Columbia River							
	Chinook	Coho	Total	Chinook	Coho	Chinook	Coho
	Million $	Million $	Million $	Million lbs	Million lbs	$/lb	$/lb
1981	30	15	45	15	12	1.97	1.29
1990	29	13	42	16	10	1.86	1.31
1999	11	2	13	8	2	1.42	0.82
Adjusted for Inflation to 1999 $							
1981	50	25	75	15	12	3.28	2.14
1990	35	16	51	16	10	2.23	1.58
1999	11	2	13	8	2	1.42	0.82
Source PSMFC-WOC-All Species Reports							

Regional Impacts--Table 10 illustrates the various contributions of commercial and recreational salmon and steelhead fishing to each of the states and to British Columbia, Canada. These estimates indicate that during 1994, these activities have directly and indirectly contributed over $400 million annually in personal income to the Pacific Northwest (PNW). There are alternative estimates that have been published and relate to steelhead that need to be explored. With respect to steelhead in Idaho, a recent analysis "The Economic Impact of a Restored Salmon Fishery in Idaho" by Don Reading (July 1999) shows that a restored salmon fishery and the accompanying steelhead recreational fishery would support $170 million in economic expenditures and support 5,000 jobs in the state. Appendiix G shows similar estimates for California steelhead.

Table 10. Representative Annual Harvests of Salmon and Steelhead and Economic Contribution – 1994

Region	Fishery	Pounds or Angler Days (in 1000s)	Estimated Regional Economic Contribution Personal Income in $1000s
Alaska	Commercial	800,000	1,207,000
	Recreational	1,925	205,000
	Total		1,412,000
Canada	Commercial	150,000	353,100
	Recreational	5,970	191,000
	Total		544,100
Washington	Commercial	34,000	69,600
	Recreational	4,180	134,000
	Total		203,600
Oregon	Commercial	5,000	17,100
	Recreational	3,660	116,600
	Total		133,700
California	Commercial	5,000	18,300
	Recreational	1,930	103,000
	Total		121,300
Idaho	Commercial	0	0
	Recreational	300	8,800
	Total	300	8,800
Pacific Northwest	Commercial	44,000	105,00
	Recreational	10,070	362,400
	Total		467,400

(Adapted from Radtke (May 1997) as Reported in Anadromous Fish Economic Analysis-Lower Snake River Juvenile Migrations Feasibility Study, Foster Wheeler Environmental Corps and U.S. Army Corps of Engineers, October, 1999 Table 2.VI.1)

Commercial--The Northwest Power Planning Council's Human Effects Analysis states that (pp. 4-6):

> "Beneficial effects in commercial fisheries are primarily producer surpluses associated with increased revenues. Increased revenues might be associated with increased catch per unit of effort as well as increased effort in response to better fishing. Increased harvest revenues, profits, and incomes benefit producers and workers in the industry. Consumers benefit if prices are reduced, but reduced prices are not likely in today's global salmon markets. Some localized consumer benefits with the fresh market are possible. Tribal benefits would include improved relative per capita incomes and reduced poverty."

The Corps study states (Part 1, Chapter VIII, p.17) that:

> "The analysis used in this report assumes a 70% ex-vessel value as a proxy to account for contribution from the harvest sector, processing sector, and other affected businesses. However, some analysts argue that the percentage should be higher to account for the use of labor from areas such as tribal areas where there are high levels of unemployment, because the opportunity cost of such labor is zero. In such instances, relationships would have to be made specific to each fishery (troll, gillnet, non-tribal and tribal). To compute the net economic benefits from commercial fishing the costs of harvest (fuel, repairs, labor, etc.) should be subtracted from the gross revenues (ex-vessel price). Because the fishing season is of short duration, most fishing boats are not limited to salmon fishing. The investment in boat and gear is also used for other fisheries. Also, at low levels of total salmon harvest and with small incremental changes in salmon production, it is often argued that any increased harvest could be taken with almost the same amount of labor, fuel, ice, etc. as before. Since current fisheries (both the harvesting and processing sector) are greatly overcapitalized, in use of fixed and operating capital as well as labor, this is a plausible assumption. The assumption implies that almost no additional costs are involved and gross benefits are close to net benefits."

The effects discussed above are primarily short run in nature; in the long run as stocks return there may be an additional increase in costs as fishermen upgrade or purchase new vessels.

Both the Corps and the NWPPC review a series of studies where ex-vessel revenues are multiplied by percentages that range from 50% to 90% to estimate Net Economic Value (NEV) because of a lack of good cost-earnings and demand analysis for salmon fisheries. Both the Corps and the NWPPC studies adopt a multiplier of 70%. For this rule, to calculate the NEV associated with commercial fisheries, the increased amount of commercial salmon harvest would have to be determined. This information is unavailable. However, if this rule and other efforts associated with salmon recovery are such that coho and chinook harvests and revenues were increased from 1999 levels of 10 million pounds and $13 million to 1991 levels of 26 million pounds and $42 million, then using this crude approach to approximate net economic value would lead to an estimate of $20 million annually.

Recreational --The NWPPC study states (pp. 4-7) :

> "New recreational fishing opportunities and improved recreational fishing quality would affect consumers and producers. Improved quality, such as increased catch rates, increases the user's value per unit time of recreation. The amount of time spent also increases as the enhanced activity attracts more users and more time per user. On the producer's side recreationalists spend more money in pursuit of fish and game, and this increased spending increases profits in the recreation industry. Some of the increased spending in the fishing and hunting industry may be offset by reduced spending in other economic sectors because some users are merely changing the location of their expenditures."

Both the Corps and NWPPC study review various studies that vary by methodology, fishery, fishery location, and unit of measure ($ per fish caught or $ per day per person). The Corps study states (Part 2, Chapter II, p.19):

> "The values for salmon and steelhead range between $22 and $78 per day. The values for ocean salmon fishing range between $32 and $89 per day. The earliest study was done in 1962 and the most recent was done in 1998 on the Snake River. .....As in estimating economic impacts, a one fish per day is used as a proxy for valuing anadromous fish of the Columbia River Basin, unless other specific information is available, the general guideline is that, for recreational use value, $52.85 for steelhead and $51.43 for salmon per day and (therefore per fish) represents the value that recreational anglers place on a salmon/steelhead produced in the Columbia River Basin, independent of where they are caught."

The NWPPC analysis differs on the estimates of salmon and steelhead (p.4-9):

> "The analysis assumed 24 hours to harvest one steelhead and an average of 7.2 hours per fishing day. With the data in Table 4-2, the average value per steelhead harvested can be estimated as $130 to $253 [24/7.2} time 39 or 76). For chinook salmon, 35 hours were required to harvest one fish and the daily value was $76...."

If as a result of salmon and steelhead recovery, the number of angler days were doubled, at $50 per day, this would translate into over $500 million in Net Economic Value being generated annually, given current estimates of annual recreational effort of about 10,000 angler days. At $50 per fish, a similar result would occur as numbers reported above suggest that annual harvests of salmon and steelhead during the 1995-1997 period would also be about 10,000 fish in total. On one hand, it is noted that as the number of fish that are available to harvest increases, the average angler will be willing to pay less for each additional fish; but on the other hand, increased availability of fish may increase the number of anglers. Certainly, with the huge increases in total regional population, cited above, the pool of 'potential' recreational fishermen is much greater than was the case even five or ten years ago. With increased leisure time and rising disposable income, demand for all forms of recreation (and thus, their intrinsic economic value) have grown, both regionally and nationally. This trend is likely to continue for the foreseeable future, in effect, increasing the

marginal value of each additional unit (in this case) of steelhead and/or salmon recreational fishing, suggesting that the foregoing estimates are likely 'conservative'.

(b) Tribal Rights and Values: Tribal fishery values are partially addressed in the preceding section. However, such statistics do not reflect the value of ceremonial and subsistence fisheries that have been severely impacted by declines in salmonid health. Nor can the importance of salmon to the core of tribal culture in the Northwest be in any way reflected by simple numbers showing the decline of harvests over time, or the potential for increased tribal incomes that would accompany a recovery of these threatened ESUs. As reported in the NWPPC study (p.3-6):

> "...while economic issues are of keen interest to Tribes due to their critical needs for jobs and improved incomes, the Tribes consider spiritual, cultural, and life-style values associated with fish and wildlife of paramount importance - and these cannot be adequately or accurately represented by contemporary economic measures...."

Or, in the words of Donald Sampson, 1994 Chairperson, Confederated Tribes of the Umatilla Indian Reservation:

> "Salmon are the centerpiece of our culture, religion, spirit, and indeed, our very existence... Our people's desire is simple—to preserve the fish, to preserve our way of life, now and for future generations." (Columbia River Inter-Tribal Fish Commission, 1999)

The importance tribes place on salmonid recovery is reflected in many ways, including organizational. The Columbia River Inter-Tribal Fish Commission (CRITFC) is the technical support and coordinating agency for fishery management policies of the four Columbia River treaty tribes. Membership includes the Confederated Tribes of the Warm Springs Reservation of Oregon, the Confederated Tribes and Bands of the Yakama Indian Nation, the Confederated Tribes of the Umatilla Indian Reservation, and the Nez Perce Tribe. The Northwest Indian Fisheries Commission was created in 1974 by the treaty Indian tribes in western Washington as a result of the U.S. v.Washington litigation that affirmed fishing rights reserved by the tribes in treaties signed with the federal government in the 1850s. The commission assists the tribes in conducting biologically-sound fisheries and provides a unifying focus for fisheries management and conservation issues. Member tribes are Nisqually, Squaxin Island, Puyallup, Jamestown S'Klallam, Port Gamble S'Klallam, Lower Elwha Klallam, Skokomish, Swinomish, Sauk-Suiattle, Upper Skagit, Tulalip, Makah, Stillaguamish, Muckleshoot, Suquamish, Nooksack, Lummi, Quinault and Quileute. These organizations, as well as individual tribes such as the Shoshone-Bannock Tribes and the Confederated Tribes of the Colville Reservation.

The value of salmon is also reflected by the degree to which tribes and tribal members view their relationship to salmon as integral to community and individual health and well being. The NWPPC reviewed levels of poverty, unemployment, income, and mortality rates for various Columbia River tribes and compared them to averages for Washington, Oregon, and Idaho. Among the tribes, poverty rates ranged from 28 to 44 percent compared to statewide averages from 9 to 12 percent. Tribal unemployment rates ranged from 14 to 50 percent, compared to state

averages from 5.7 to 6.2 percent. Tribal per capita incomes ranged from $5,000 to $8,000 compared to statewide averages from $11,500 to $14,900. (NWPPC 2000). As noted by Chris Walsh, a Yakama Psycho-social nursing specialist:

> "[T]here's a huge connection between salmon and tribal health. Restoring salmon restores a way of life. It restores physical activity. It restores mental health. It improves nutrition and thus restores physical health. It restores a traditional food source… . It allows families to share time together and build connections between family members. It passes on traditions that are being lost. If the salmon came back, these positive changes would start." (Chris Walsh, in Columbia River Inter-Tribal Fish Commission, 1999)

Clearly, tribes would place an enormous value on restoration of some semblance of prior salmonid runs and the habitat functions to support them. Because of treaty obligations, although not readily amenable to 'quantification', improvements in salmonid run size and habitat represent a real and attributable benefit to the health and welfare of the region and the Nation as a whole.

(c) Passive Use Values: There have been a number of studies concerning the passive use value of restoring salmon where surveys were done and respondents were asked questions similar to the following. "How much would you be willing to pay if the "runs were doubled?" "How much would you be willing to pay for recovering salmon as a result of breaching the Elwa dam ?" Depending on the question asked, the context of the question, and the group of respondents being asked, these estimates range (from about $35 to $140 annually per household). These estimates relate to the overall recovery of some or all of the stocks. Recovery requires not only a halt to further habitat degradation, but habitat restoration, and activities in the harvest, hydropower, hatcheries areas as well. This rule is primarily about halting the "take" of listed salmonids by activities that take place on private lands and outside of Section 7 process of the ESA which requires that Federal agencies consult with NMFS before undertaking any action (project, permit or funding) on federal or private land. While these estimates suggest that there are significant values associated with recovery of salmon, it is too difficult to extrapolate these estimates to the effects of this rule. (Appendix H presents a discussion of these issues.)

(d) Indirect Use Value: Restoring salmon habitat may have indirect benefits by aiding nutrient recycling, providing protection to watersheds, improving air, water, and climate quality. Improvements in these areas may help restore other fish and wildlife, increase recreational benefits, increase the amount of drinkable water, and improve productivity of agricultural lands and forests. This rule will cause some, unquantifiable increase in these indirect benefits.

Summation: Although not required for ESA decisions, many believe that ESA decisions should be evaluated via use benefit-cost analyses. However, even if appropriate, there is insufficient information to do such an analysis as there are incomplete estimates of benefits and costs. Available quantitative information generally relates to recovery of salmonids generally, rather than to the particular species/ESUs associated with this rule. In addition, available quantitative information relates to activities that are associated with both federal and private lands-whereas this

rule is associated with activities that occur on non-Federal lands and outside of a federal nexus that would invoke Section 7 consultations.

However, available information showed that there are significant benefits to be achieved if the activities governed by this rule help lead to recovery of salmonids. Potential gains in net economic value in commercial and recreational fisheries were discussed above. If harvests were returned to 1991 levels, the annual net economic value derived from commercial fisheries was projected to be $20 million while the net economic value derived from recreational fisheries was projected to be $500 annually. Extrapolation of a recent Washington State Study on the values Washington households place on restoring salmon suggest that Northwest households are willing to pay $1.0 billion to $2.3 billion annually to restore salmon to twice the levels they are now. These estimates of net economic and passive use values do not reflect values placed on salmon by the Tribes or the values placed on recovery by citizens outside the Pacific Northwest. Nor do these estimates reflect potential ecosystem benefits or potential cost savings to various industries that may result from improving salmonid habitat.

The above discussion also showed that to recover salmon, substantial costs would be incurred. For example, the NWPPC estimates that urban, forest, and agricultural related habitat restoration activities in the Columbia Basin could range from $39 million to $680 million per year. Costs would be imposed on government entities as well. For example, the City of Mountlake Terrace (population 21,000) has reported that to meet ESA requirements, could require budgeting for another $150,000 to $200,000 annually.

These quantitative estimates concern recovering all salmon and other species-not just the species of salmon and steelhead associated with this rule. As discussed previously, there is insufficient information to adjust these estimates with respect to activities that are associated with other ESA decisions, increased enforcement of the Clean Water Act, or with other federal, state, and local land use or wildlife goals and objectives (See Section 6(e)).

There are two other issues to consider: The first issue is the timing of the benefits and the costs. This rule would cause costs to be incurred in the present and into the future while noticeable benefits are not likely to be seen for a number of years. To estimate the net economic benefit of this rule, net-present value or discounting techniques would have to be employed to adjust the costs and benefits that accrue at different times so that they are comparable in present day terms. The second issue concerns the uncertainty about potential costs and benefits. One of the areas of uncertainty concerns the degree to which these rules aid the recovery of salmon and steelhead. Currently scientists are debating projections concerning the restoration of Columbia/Snake River stocks via the removal of dams. Attempts are also being made to evaluate the physical and biological impacts of potential habitat restoration activities upon some Columbia River stocks. However, there are no scientific analyses that relate in a quantitative manner the probabilities of salmon recovery to activities governed by this rule. Another source of uncertainty concerns other salmon restoration activities. This rule is just one element of a potential recovery package. Activities that benefit salmonids in the areas of federally regulated or funded harvest, hatcheries, habitat associated with federal lands, and hydropower are also required. Therefore, the benefits

and costs associated with this rule are dependent, to an undeterminable extent, on current and future decisions with respect to these other activities.

The Preliminary draft of "A Standardized Quantitative Analysis of Risks Faced by Salmonids in the Columbia River Basin" (March 29, 2000, p iii) highlights the present level of scientific knowledge that underlies current and future decisions that will be made under this rule:

> "The more difficult task is exploring opportunities for improving lambda, i.e., increasing the number of recruits per spawner. The well-known "four H's" (hydropower, habitat, hatcheries and harvest) represent the human-influenced arenas in which management can be altered in hopes of recovering ESUs. But because these four H's vary enormously in the areas occupied by different ESUs, it is unlikely that a simple prescription can be drawn up that fits all ESUs.
>
> For example, the number of dams per thousand square kilometers varies from 0.4 to 2.8 depending on the region associated with each ESU. Land use characterization also varies widely across regions occupied by ESUs, with some regions characterized by a high percentage of rangeland (Upper Columbia and Snake Rivers), urbanization (lower Columbia, and upper Willamette Rivers), or cropland (upper Willamette River). At the finer scale of index stocks, preliminary analyses indicate that three habitat variables at the subwatershed scale explain 60% of the variation in recruits per spawner: (1) percent of land classified as urban, (2) proportion of stream length failing to meet EPA water-quality standards, and (3) the ability of streams to recover from sediment flow events.
>
> Lastly, although nearly 100 hatchery facilities in the Columbia Basin release approximately 150 million smolts annually, the magnitude of this hatchery production varies by an order of magnitude among ESUs. The impact of this hatchery production is difficult to analyze because of the lack of large-scale controlled experiments. Some preliminary analyses suggests that in "poor ocean years" hatchery fish compete with wild fish and lower the survival rates of the wild fish.
>
> In summary, there are no clear-cut analyses that allow confident predictions about likely improvements in lambda if actions are taken in hydropower, habitat or hatcheries. Generating such predictions is clearly a research priority. But right now, science cannot provide hard numbers on questions about how any ESU will respond to any particular management option, although the direction of effects and what would qualitatively represent an "improvement" are usually known..."

9. Comparison of the Alternatives

To highlight the differences between the alternatives in terms of economic benefits, the Comparison Table (Table 11) shown below has been developed, with columns listing the alternatives and rows that reflect criteria or issues. The number of stars (*) in each cell reflects the expected relative ranking of the alternative with respect to each criteria. Because they are ordinal rankings without quantitative measurement, they cannot be added to see which alternative is best. However, these rankings do help explain why the preferred alternative may lead to greater economic benefit than the other alternatives.

The criteria in the Comparison Table shown below have economic content. The number of incidental take permits associated with each alternative reflects part of the costs of complying with the regulations. The extent of activities covered by specific regulations and guidelines is an indicator of the degree and certainty of information available to an individual person, firm, or government to determine if an activity will result in a violation of the regulations. Alternatives are compared with respect to whether they offer the flexibility of choices in how to comply. The greater the amount of flexibility provided, it follows logically, the greater the probability that a least cost solution will be found. Alternatives will differ with respect to the costs for NMFS to develop, implement, and monitor the associated regulations which in turn is related to the number of incidental take permits that may be needed to be processed.

Economists assert that the use of economic incentives (e.g., taxes and subsidies) may be better ways to achieve conservation than by imposition of standards. Standards are not usually based on the value of the good, and there is a lower risk of non-compliance with taxes as they are easier to enforce than standards. Taxes provide a firm with greater incentive to reduce environmental harm and to undertake research for more environmentally friendly technology and production methods than do standards. (Turner et. al, 1993,p 170). NMFS has no ability to use economic incentives to protect salmon, but state and local governments may have that ability to assess or adjust taxes on water, power, and property in ways that provide incentives to protect salmon. Therefore, those alternatives that allow a greater role for state and local governments increase the probability that economic incentives can be used.

As mentioned earlier, other laws such as the Clean Air Act or state and local regulations concerning urban development, agricultural and forest practices, or water use and flood control may provide elements that protect salmon. Alternatives that do not build on these efforts run the risk of being in conflict or adding unnecessary regulatory burden. NMFS believes the probability of compliance increases with more state and local government and citizen involvement in the development of strategies for protecting natural resources, including threatened salmonids, particularly if the regulation defers to state and local government rules and guidelines where those are adequate. That also minimizes overall enforcement and monitoring costs.

Table 11. Comparison Table

		Ordinal Ranking of Alternatives by Criteria		
Criteria	**No Action**	**Blanket Prohibition**	**Specific Regulation**	**Blanket Prohibition with Limits/ Exceptions**
1. Number of Incidental Take Statements	N/A	****	*	*
2. Activities Covered by Specific Regulations and Guidelines	N/A	*	***	**
3. Flexibility to Adapt Activities	N/A	****	*	***
4. Degree of State/Local/Citizen involvement	N/A	N/A	*	**
5. NMFS Administrative Costs & Direct involvement in State and Local Decisions	N/A	***	****	*
6. Probability that Economic Incentives can be Employed	N/A	*	*	**
7. Consistency with other Laws and State and Local Planning Efforts	N/A	N/A	*	**
8. Probability of Compliance	N/A	**	*	***
9. Uncertainty about What Constitutes a Violation	N/A	***	*	**
10. Enforcement and Monitoring Costs	N/A	**	***	*
11. Probability of Correct Standards, Limitations, and Prohibitions	N/A	N/A	*	***
12. Financial Burden on Citizens, Businesses, State & Local government	N/A	**	****	*
*=lowest				
**				
***				
****				
*****=highest				
N/A=Not Applicable				

Compliance also increases as the uncertainty about "take" is reduced. That is, the more information that the individual landowner or business owner has about what constitutes a "Take," the more owner knows about his potential liability and whether he needs to modify his activity. Uncertainty is reduced by increasing the amount of activities covered by specific guidelines and regulations, by providing for public involvement in developing these guidelines and regulations, and by assuring that salmon restoration regulations build upon existing laws and state and local planning efforts.

It is fair to assume that when standards and prohibitions can be locally tailored or industry tailored, then there is a higher probability that such regulatory activities will be correctly applied, with businesses and landowners absorbing the appropriate compliance costs. If the regulatory requirements are too generic, there will be instances of unnecessary burden being applied on the public, especially on those entities that otherwise would have to do nothing (e.g. unnecessary fencing or screening of streams in light of a generic regulation that states that all streams must be fenced and screened). The amount of financial burden being placed on citizens, businesses, and on state and local government will depend on the potential number of incidental take permits that might be needed, the amount of flexibility that the public is given to adapt their activities to be salmon friendly and the regulations themselves.

Drawing on the Comparison Table, the alternatives and our selection among them may be described as follows:

Alternative 1 - No Action: This alternative would allow all non-Federal actions to proceed without considering their impacts on listed salmonids. States could allow fishing targeted on the listed fish. Landowners and managers could proceed with activities without considering impacts on listed fish.

In the short run, there would be no financial impacts (other than those due to continued decline of salmonid populations), but there would also be little incentive to undertake salmon restoration activities or prevent "take." Consequently salmon and steelhead species would continue to decline. Most likely these declines would lead to eventually "downgrading" the listing status of many of these species to that of "endangered." With endangered status, §9 prohibitions, including a blanket prohibition on take would apply. Those prohibitions would be much more rigid than the approach taken in this rule. It would not be possible to recognize "limits" on the prohibition, and it would be far more difficult to grant incidental take authorizations under §7 or 10 of the ESA, because of the need to be more cautious with respect to potential harm to salmon. In the end, following this scenario, a decision at present to adopt the "No Action" alternative could result in exceedingly high economic and social costs in the future.

For example, a recent NMFS' scientific analysis of salmon and steelhead stocks in the Columbia River concluded:

> "The result of that further analysis is this draft study, summarized below. It is straightforward: all the Columbia River Basin salmon stocks are in a state of perilous

decline, especially Upper Columbia Spring Chinook and Steelhead throughout its range. Put in starker terms: without substantial intervention, there is a greater than 50:50 chance that most of these ESUs will be extinct by the next century, some much sooner."

Further, by delaying protective measures, we would increase the chances that recovery will not be achieved, and decrease the chances of reaping the huge potential benefits of recovery.

Alternative 2 - Blanket Prohibition: Blanket application of §9 protections, including the prohibition on take of the listed salmonids: The take prohibition is akin to an enforceable performance standard rather than a design standard or command and control regulations. Under the blanket take prohibition, individuals and entities can determine the best means to avoid taking listed fish, given their particular circumstances. Performance standards are generally preferred to a command-and-control design standard because they give regulated entities the flexibility to achieve the desired regulatory outcome in the most cost-effective way.

The number of entities potentially affected by imposition of take prohibitions is substantial. The geographic range of these regulations crosses four states. Activities potentially affecting salmonids are those associated with agriculture, forestry, fishing, mining, heavy construction, highway and street construction, logging, wood and paper mills, electric generation services, water transportation, and other industries. As many of these activities involve local, state, and Federal oversight, including permitting, governmental activities from the smallest towns or planning units to the largest cities will also be impacted. The activities of some nonprofit organizations will also be affected by these regulations.

With the take prohibitions in effect, individuals or entities will conduct their own risk analysis of whether the way in which they are conducting affairs is likely to take salmonids. If that assessment concludes that there is risk, the individual or entity may alter activities to a greater or lesser degree, depending on their particular factual and physical circumstances, the strength of their desire to be in compliance, or their willingness to be at risk of an enforcement action. Any such alterations carry costs. For example, an individual or entity might build a fence to keep livestock out of a stream; create riparian buffers; repair farm or forest roads that are in danger of failure and consequent sediment damage to salmon habitat; replace culverts or crossings that are blocking fish passage; reduce use of pesticides and/or modify application of pesticides, especially in riparian areas; or not cultivate or harvest trees adjacent to streams. A state fishery agency may alter fishing seasons, gear, or location to avoid situations where listed fish would be unintentionally hooked and hence injured.

With take prohibitions in place, some individuals may decide to seek §10 incidental take permits, to have certainty that they will not be subject to ESA enforcement and litigation. The creation of a conservation plan to support an incidental take authorization is a practical alternative for those managing or controlling fairly extensive lands or programs, but may entail relatively high transaction costs for a small entity or landowner. The approach in this rule provides a more programmatic pathway for those wishing to be sure they are complying with ESA and protecting salmonids.

Alternative 2 provides the greatest degree of flexibility which would lead to lower cost solutions and economic impacts for those with the resources or knowledge to determine efficient strategies for minimizing risk. For others, however, this strategy leaves a high degree of uncertainty and in some cases, anxiety about those risks. Further, this alternative also may be associated with the greatest number of requests for incidental take permits. These permits would be on a case-by-case basis with much of the burden of providing the necessary information placed on the applicant.

Alternative 3 - Specific Prescriptions: Another alternative considered was the imposition of prescriptive regulations - a "command and control" or "design standards" approach. Under this approach, NMFS would specify (as an example) particular design standards for forest road construction or maintenance. Thereafter all forest managers would be required to use those standards or be in violation of ESA regulations, regardless of whether the road design they had selected was actually harming or otherwise taking listed salmonids. Similarly, NMFS could require that every structure that diverts water from a water body while juvenile listed salmonids are present must be screened according to NMFS' screening guidelines, or risk an enforcement action by NMFS or in a third party suit. Prescriptive regulations require entities and individuals to proceed immediately with a particular design solution, without the possibility of examining alternatives.

The advantage of such prescriptions is that the required protective measures are clearly defined, and with sufficient enforcement and voluntary compliance, could be in place relatively rapidly and uniformly. The disadvantage is that it eliminates consideration of other solutions that might better fit the site and circumstances of a particular party, be less costly and administratively burdensome, and still assure that listed fish will be protected. Therefore, of all the alternatives this alternative probably places a greater economic burden on the public because individuals or jurisdictions would be required to implement particular protective measures, even if there might be a lower cost solution suitable for the particular geographic or technologic characteristics of their situation. In addition, this alternative ranks the highest with respect to NMFS administrative costs and involvement with state and local decisions. It also would involve greater enforcement and monitoring costs, because of the need to develop, implement, monitor, and enforce specific regulations for every activity. Finally, it would take a long time to develop such prescriptions. This would delay the recovery of salmon and potentially lead to even more burdensome regulations to compensate for the effects of the delay.

Alternative 4 - Limited Application of Take Prohibitions: This alternative combines the take prohibitions with limits wherever warranted biologically, and thus combines the positive aspects of the other alternatives, while minimizing the adverse or undesirable aspects. This alternative meets the statutory mandate and requirement that all necessary and advisable regulations are to be implemented. It provides the performance standard for protection of the fish (i.e., "do not take"), and leaves any entity free to determine the optimum approach to compliance/ risk reduction for that entity's specific circumstances.

At the same time, this alternative provides a pathway for any entity that wishes to pursue the certainty of ESA compliance through a "limit." Where this rule offers "limits," the program or entity coming within a limit will incur some costs by virtue of the commitment to provide adequate protection for salmonids, but will avoid the costs of uncertainty and litigation risk involved in determining an individual approach to avoiding take. Because it builds a programmatic approach in reliance on adequate state or local programs, it also provides a pathway that may entail fewer transaction costs for small entities and individuals than pursuing individual §10 authorizations. NMFS' involvement will become more one of oversight and not direct regulation or enforcement. While Alternative 4 continues to provide flexibility (because limits are not mandatory) it also offers the greatest probability that economic incentives would be employed, and a higher probability of compliance. For these reasons, it is also likely that the economic burden on the public would be the smallest, among the range of alternative under consideration.

10. Conclusions

Recognizing that there may be economic impacts as a result of this rule, NMFS has undertaken an assessment of the costs and benefits of this regulatory action but cannot make a conclusion on whether the benefits outweigh the costs because of a lack of quantitative data. In the past NMFS and the U.S. Department of Fish and Wildlife have generally employed take prohibitions in a blanket fashion. This final rule takes a new approach, identifying numerous limits to those prohibitions. NMFS believes that this rule creates a novel approach to protective measures for threatened species under the ESA consistent with providing maximum opportunity for state and local government to craft locally tailored responses to salmonid protection needs.

NMFS has now completed an RIR which lays out information related to costs and benefits of available regulatory alternatives, including the alternative of not regulating. The RIR identifies the problems this rule addresses, continued decline of threatened salmonid stocks due to a broad collection of human activities across the landscape. Section 4(d) of the ESA requires NMFS to promulgate such protective regulations as the Secretary deems necessary and advisable to provide for the conservation of threatened ESUs. NMFS did not identify any existing regulations that could be modified to achieve that charge more effectively. Nor does this rule duplicate or establish inconsistent standards with other rules. The RIR describes the alternatives NMFS considered in order to find an alternative that provided maximum flexibility to individuals and entities, minimized economic costs, disruptions and burdens, while assuring a reduction in the risk of extinction for ESU salmonids.

Costs and benefits include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits where estimates cannot be meaningfully made for impacts that are essential to consider. The analysis is predominantly qualitative because there is insufficient information upon which to quantify the effects of this rule. Consequently, the alternatives were compared using a number of criteria that address the probability of recovery, the reduction of the individual's uncertainty on whether his activity constitutes a "take", administrative burden, and on the flexibility of individuals, governments, and companies to find ways to avoid take and be involved in regulatory decision making. Based on

this comparison, it was concluded that Alternative 4, Limited Application of Take Prohibitions, is the preferable alternative and implemented by this final rule making. Alternative 4 combines a performance standard (i.e., "do not take") with recognition of the regulatory programs of other levels of government wherever possible, and sets up a procedure for amending this rule to allow other qualified programs into the 4(d) regulatory framework.

The ESA limits NMFS to alternatives that lead to recovery, but in choosing among alternatives, we are obligated to consider selecting the approach with the fewest negative economic consequences. NMFS has concluded that among the alternative regulatory approaches, the approach in this final rule (with changes made in response to public comment) is likely to generate benefits that include potential economic, environmental, and other advantages, distributive impacts, and equity. It will also minimize costs by providing flexibility to individuals and jurisdictions to select the least cost method of compliance that is consistent with the constraints of the ESA. Because this alternative recognizes adequate state or local programs, NMFS involvement will be more collaborative and less often require enforcement actions. We believe the final rule has the greatest probability that compliance burdens will be fairly shared, that economic incentives will be employed in appropriate cases, and that practical standards adapted to the particular characteristics of a state or region will aid citizens in reducing the risks of take in an efficient way.

For these reasons, it is likely that this alternative will minimize the economic burden on the public of avoiding take over the long term. For some entities, the approach will reduce paperwork and regulatory compliance burdens associated with individual §10 incidental take permitting. It will also make better use of scarce Federal resources, reducing administrative costs by emphasizing programmatic approaches to minimizing take of threatened salmonids. Because it allows for local decision making and can be integrated into existing land, water, and other resource policies, the economic impacts of this rule will likely be less adverse or more beneficial in total as a result.

In sum, NMFS finds this rule necessary and advisable to carry out its responsibility to protect threatened salmonids under the ESA and to its trust responsibilities to tribes for which these salmonids have tremendous economic and cultural significance. While there may be impacts to some economic sectors within the 14 ESUs covered by this rule as a result of avoiding risk of take, it is important to put that fact in context: for over 3/4 of the counties subject to this rule, take prohibitions are already in place to protect some other salmonid species, so that there will be no or few incremental impacts from this rule related to land management and development activities.

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Appendix A – Background on Executive Order 12866

The objective of E.O. 12866 (58 FR 51735, October 4, 1993) is to improve the Federal regulatory system. NMFS complies with part of E.O. 12866 by preparing a RIR of proposed regulations. The regulatory philosophy of E.O. 12866 is reflected in the following statements. Federal agencies should promulgate only such regulations as are required by law, are necessary to interpret the law, or are made necessary by compelling public need, such as material failures of private markets to protect or improve the health and safety of the public, the environment, or the well-being of the American people. In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages, distributive impacts; and equity), unless a statute requires another regulatory approach.

To ensure that the agencies' regulatory programs are consistent with this philosophy, agencies should adhere to the following principles, to the extent permitted by law and where applicable:

(1) Each agency shall identify the problem that it intends to address (including, where applicable, the failures of private markets or public institutions that warrant new agency action) as well as assess the significance of that problem.

(2) Each agency shall examine whether existing regulations (or other law) have created, or contributed to, the problem that a new regulation is intended to correct and whether those regulations (or other law) should be modified to achieve the intended goal of regulation more effectively.

(3) Each agency shall identify and assess available alternatives to direct regulation, including providing economic
incentives to encourage the desired behavior, such as user fees or marketable permits, or providing information upon which choices can be made by the public.

(4) In setting regulatory priorities, each agency shall consider, to the extent reasonable, the degree and nature of the risks posed by various substances or activities within its jurisdiction.

(5) When an agency determines that a regulation is the best available method of achieving the regulatory objective, it shall design its regulations in the most cost-effective manner to achieve the regulatory objective. In doing so, each agency shall consider incentives for innovation, consistency, predictability, the costs of enforcement and compliance (to the government, regulated entities, and the public), flexibility, distributive impacts, and equity.

(6) Each agency shall assess both the costs and the benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs.

(7) Each agency shall base its decisions on the best reasonably obtainable scientific, technical, economic, and other information concerning the need for, and consequences of, the intended regulation.

(8) Each agency shall identify and assess alternative forms of regulation and shall, to the extent feasible, specify performance objectives, rather than specifying the behavior or manner of compliance that regulated entities must adopt.

(9) Wherever feasible, agencies shall seek views of appropriate State, local, and tribal officials before imposing regulatory requirements that might significantly or uniquely affect those governmental entities. Each agency shall assess the effects of Federal regulations on State, local, and tribal governments, including specifically the availability of resources to carry out those mandates, and seek to minimize those burdens that uniquely or significantly affect such governmental entities, consistent with achieving regulatory objectives. In addition, as appropriate, agencies shall seek to harmonize Federal regulatory actions with related State, local, and tribal regulatory and other governmental functions.

(10) Each agency shall avoid regulations that are inconsistent, incompatible, or duplicative with its other regulations or those of other Federal agencies.

(11) Each agency shall tailor its regulations to impose the least burden on society, including individuals, businesses of\ differing sizes, and other entities (including small communities and governmental entities), consistent with obtaining the regulatory objectives, taking into account, among other things, and to the extent practicable, the costs of cumulative regulations.

(12) Each agency shall draft its regulations to be simple and easy to understand, with the goal of minimizing the potential for uncertainty and litigation arising from such uncertainty.

If a proposed action is determined to be significant under E.O. 12866, the analysis undergoes further scrutiny by the OMB to ensure that it meets the requirements of E.O. 12866. A "significant regulatory action" means any regulatory action that is likely to result in a rule that may:

- Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

Appendix B – Pacific Rivers Council Press Release

Adapted from Pacific Rivers Council Press Alerts (January 2000)
http://www.pacrivers.org/alerts/salmontimber.html

Economic Benefits of Salmon Protection Equal or Exceed Costs

The Pacific Rivers Council, Oregon Trout, Audubon Society of Portland and the Institute for Fisheries Resources release "Salmon, Timber and the Economy" report.

Eugene, Ore - A new report concludes that many of the proposed logging restrictions on private and state lands, which biologists say are needed to rebuild healthy salmon populations, would have economic benefits that outweigh the costs. "Most reports about the economics of salmon recovery focus solely on the costs," said Ed Whitelaw, economist with ECONorthwest in Eugene. "A complete economic assessment must also include the benefits of salmon protection, and there are many."

ECONorthwest prepared the report, "Salmon,Timber and the Economy" for the Pacific Rivers Council, Oregon Trout, Audubon Society of Portland and the Institute for Fisheries Resources.

The most apparent benefit from logging restrictions to protect salmon would be an increase in salmon populations. This is important to the commercial-fishing industry, recreationists, and those who treasure salmon's intrinsic value.

In addition, logging reductions should yield cleaner streams, by reducing logging-related sediment. Sediment generated by clearcutting just one acre can cause damage downstream totaling about $200.

"This thorough study reinforces the notion that forested watersheds make their highest contribution to the economy when they're in their best shape ecologically," said David Bayles, conservation director for the Pacific Rivers Council, "when they provide not just logs but also clean water, abundant fish and wildlife habitat, irreplaceable recreation and flood protection." “Preserving and protecting salmon habitat acts like financial assets," said Whitelaw. "It generates a flow of economic benefits over time." If habitat improvements from salmon-related logging restrictions generated one additional fish for the recreational fishery per year for the foreseeable future, the asset value of the habitat would be about $2,800, Whitelaw says. By comparison, the average timber-asset value of state and private land used for growing timber is about $400 per acre in western Oregon. So, if logging restrictions converted one acre of private or state land from producing just timber to producing one salmon per year for the recreational fishery, the asset value of the new salmon habitat would be about seven times the forgone timber-asset value of the land.

"Salmon, Timber and the Economy" also finds that some of the confusion over the economic consequences of rebuilding healthy salmon populations stems from studies that have exaggerated the potential costs of salmon protection. A report prepared by associations representing many of

the state's private timberland owners, for example, claims that logging restrictions associated with salmon protection proposals would cost them as much as $8,000 per acre. Whitelaw says several other, arm's-length studies indicate the true costs probably would be 1-10 percent of that, i.e., $80-$800 per acre. Even these estimates, however, fail to account for the benefits that would accompany the logging reductions.

The importance of looking at both the benefits and the costs of salmon protection was recognized by 76 economists who recently sent a letter to the governors of the four Pacific states and the premier of British Columbia. The economists urged the politicians to look beyond those who cast conservation as a salmon vs. economy contest by focusing solely on the costs of salmon conservation.

"This report confirms that the Oregon economy stands to gain as much, and perhaps more, from efforts to restore salmon than it would lose with fewer clearcuts," noted Glen Spain, of the Institute for Fisheries Resources. "Salmon means business, and thus salmon restoration is an investment, not a cost. The returns on that investment will benefit the whole economy in the long run."

Appendix C – EPA Press Release - Clean Water Act

Department of Justice
United States Environmental Protection Agency

FOR IMMEDIATE RELEASE
WEDNESDAY, APRIL 5, 2000

FEDERAL COURT ISSUES LANDMARK CLEAN WATER DECISION

Ruling Uphold EPA's Authority to Identify Waters Polluted By Runoff

WASHINGTON -- For the first time, a federal judge has upheld the EPA's longstanding interpretation and practice that the EPA and states have the authority to identify which U.S. waterways are polluted by runoff from urban areas, agriculture and timber harvesting -- "nonpoint sources" of pollution - and to identify the maximum amount of pollutants that may enter these waterways.

"This important decision allows us to build on our successes of completing the task of cleaning our nation's waters," said EPA Administrator Carol Browner. "The Clinton-Gore Administration has made delivering clean, safe water to all Americans a priority in our efforts to ensure greater protection for the environment in communities across the country."

The March 30 opinion by U.S. District Judge William Alsup in San Francisco affirms the comprehensive scope of the Clean Water Act's Total maximum Daily Load program. In the first decision to squarely address the issue, Judge Alsup found that Congress intended to include nonpoint source pollution in the Clean Water Act's water quality standards program, and he noted that nonpoint source pollution is the dominant water quality problem in the United States today.

"The court has affirmed a strong tool for restoring America's rivers and cleaning up pollution, regardless of its source, " said Lois Schiffer, Assistant Attorney General for the Environment Division of the Justice Department.

The court heard a challenge to an EPA decision to put the Garcia River on a list of impaired waterways in California and define the amount of sediment that should be allowed to enter the river from land along its banks. Although salmon and steelhead once flourished in the Garcia River, excessive sediment from forestry operations now prevents the river from supporting healthy fish. In March 1998, the EPA developed a "total maximum daily load" (TMDL) for sediment for the river. A TMDL defines the greatest amount of a particular pollutant that can be introduced into a waterway without exceeding the river's water quality standard. The agency also defined the reductions in sediment that are necessary for the river to attain the water quality standard set by the State of California.

The American Farm Bureau Federation and other agriculture and timber groups filed suit, claiming that the EPA and the states should calculate TMDLs only for pollutants that are discharged from pipes, or point sources. The court rejected this argument, holding that the Clean Water Act is designed to provide a comprehensive solution to the nation's water quality problems, "without regard to the sources of pollution."

In California, only 1% of impaired waterways fail to meet water quality standards solely because of pollution that comes from pipes, municipal waste treatment works, or other point sources. According to EPA, 54% of California's impaired waterways are polluted by nonpoint sources exclusively, while another 45% are impaired by a combination of point and nonpoint sources.

(Adapted from EPA News Release)

Appendix D – Excerpts from Congressional Hearings Concerning ESA and Salmon

These excerpts are from testimony from various user groups given at hearings concerning the Endangered Species Act (ESA). Although the hearings were not about this rule, the excerpts do give an image of the type of issues people are likely to raise in association with this rule.

U.S.House of Representatives, Committee on Resources, "Hearing on the Implementation of the Endangered Species Act", March 5, 1998

Statement of Hon. Gordon Ross, Commissioner, Coos County, Oregon.

"...Presently, as we work with the National Marine Fisheries Service to avoid a Coho salmon listing in Oregon, we have on our table a draft letter from them that proposes changes to the Oregon Forest Practices Act that would further reduce the harvest of timber on private, state and county lands. As we try to understand NMFS's proposal, our estimates run between a 60 and 80 percent reduction in annual harvest.

Coos County operates a 15,000-acre forest that generates revenues that fund public health and safety programs for the benefit of all county citizens. The County forest is harvested on a sustained yield basis under the regulatory requirements of the Oregon Forest Practices Act. Our Winchester Creek timber sale, due to sell March 10, contains just short of a million and a half-dollars worth of timber. Under Oregon's present statute we must leave $82,000 worth of timber along streams, under the Governor's voluntary stream side set back we will have to leave $167 000 on the land; but if the National Marine Fisheries Service scenario were place] in Oregon law, around$1,000,000 or two thirds of the sale would be lost. This is not an isolated or unique example. Most of our timber sales would be similarly impacted if the National Marine Fisheries Service prevails. This would be a death blow to programs now being supported by Coos County's timber sales program including Women's Crises Center, kelp-line, homeless shelter, retired senior volunteer programs, wildlife service, natural resource conservation programs, extension service, all health department programs from teen pregnancy prevention and water monitoring to immunization.

When we consider the entire annual harvest program, of 190 acres, we would experience a loss that would completely eliminate all County programs for public health and safety. Because 37 percent of Coos County's private sector agricultural income is from wood lots the same reduction in revenue will be experienced in the private sector so additional taxes to support these programs are not an option. In short the Endangered Species is crippling us in the West. Eventually it will be felt nationwide."

U.S. House of Representatives, Subcommittee on Fisheries Conservation, Wildlife and Oceans of the Committee on Resources, "Hearings on the Decision-Making Processes and Interagency Cooperation of the National Marine Fisheries Service Northwest Region", July 24 and August 15, 1997.

Statement of Robert Deurloo, Meridian Gold Company

"...We have spent literally millions of dollars to ensure clean water, and I join probably everyone in this room in desiring the return of the salmon. And I would say the Napias Creek is in better shape now than before the mine started construction 3 years ago primarily because of wetlands rehabilitation which was damaged by past mining practices.

...So we spent considerable time and money trying to comply with their dictates. We have performed geomorphology studies which we prove that the falls are natural, and I think NMFS has bought off on that. We have also performed extensive hydraulic and gradient studies which our fish biologists feel prove that the falls are impassable. But when presented to National Marine Fisheries, their response is, ``That is all well and good, but you would be amazed at what a fish can do." Our only appeal is to petition the Secretary of Commerce for habitat redesignation, which we have done, but we don't know if we will get an impartial hearing, and this process could take years. So here we are, tightly regulated. We must seek NMFS's permission for all of our activities, and their decisions are slow in coming.

Mining is a dynamic process. Prices change, conditions change, reserves are added. Even with minor changes, we are threatened, ``Well, this will reopen your Biological Opinion."And with this, we would be in a whole new ballgame. This happened to Hecla, and now they have to curtail their operations during periods of wet weather. A similar restriction on our operations would threaten our $80 million investment.

So we feel National Marine Fisheries needs to be more timely, more reasonable. They shouldn't be solely focused on only salmon considerations, but also should consider other factors as well. We also feel there should be a better appeal procedure rather than just suing in the Courts".

Dialog between U.S. Congressman Mickael D. Crapo, Idaho and James W. Grunke, Executive Director, Orofino Chamber of Commerce

Mr. Crapo. In the debate that we have over what approach to salmon recovery, often economics comes up and, you know, one group will say well, there are jobs in this area that we cannot ignore, irrigation for agriculture and agriculture jobs, or transportation jobs or in this case--and another group will say there are jobs related to a healthy recreation in the salmon and steelhead industry. I guess the question I have to you is does this year's experience with the salmon and steelhead runs--or the salmon runs--give you--cause you to

have an opinion on whether if that were able to be sustained over a period of time that it could be a significant economic boost to your particular community?

Mr. Grunke. I would say this gave our community a taste of what the potential would be for a strong, vibrant steelhead and salmon season, but I would not say that that is going to be our sole answer or that it is going to be the new strength of our economy. It is too unpredictable and what type of jobs is that providing for us. Is it service or is it jobs that are stable for our community, or high paying. It currently is an important part of our economy, the steelhead season, and the salmon would benefit it, but I am curious--whenever I see how great the benefits would be, I see numbers thrown out all the time, but never any documentation how they got there. The Idaho Statesman said it would be worth $248 million to the State of Idaho, according to somebody, but no citation. So I do not know. I know what we lose during the summer because of the Corps study, and I do not believe that the steelhead and salmon season would result in comparable economic gain, that would be a wash. So if we are losing $7 million in the summer, we would need to be gaining $7 million in the winter, just to stay even, and that is not occurring. And I do not think it will.

Mr. Crapo. I am aware of all the points you just made, in this debate that we constantly have about jobs and what the impact will be, so I thought I would just ask somebody from one of the communities that got to experience it a little bit this year, what your opinion was. Are you aware of any type of studies that your community has done or that have been done with regard to your community that would give a handle on what you, in your community, the people who live there, believe would be the economic impact?

Mr. Grunke. No, sir. The only study that I am really aware of is a number of years ago there was a study by the Idaho Fish and Game when they had a limited season on salmon in the Rapid River Hatchery and the economic impact to the community of Riggins, and this very small window was in excess of $200,000.And I think if you extrapolate that out, I think you could get some gains, and I think we will see some interesting studies done this year on both Orofino and--or the Clearwater River and the Riggins area, to be more concrete, but at this point, there is not a study that has been done that I am aware of.

U.S. House of Representatives, Committee on Resources, "Field Hearings on National Marine Fisheries Service's Implementation of the Endangered Species Act", September 2-3, 1998.

Statement of Ted Ferrioli, Oregon State Senate

Mr. Ferrioli. Thank you, Mr. Chairman. Again, my name is State Senator Ted Ferrioli. I represent State Senate District 28 in Oregon. Senate district 28 starts about 25 miles out of the Portland metropolitan, right across the river from the Sandy River, it continues eastward to the state of Idaho, including all or parts of 11 counties, about 17,500 square miles. Population density .17 persons per square mile...

...An analysis was done of the NMFS proposal by the Small Woodlands Association and the Oregon Forest Industries Council, and my colleague from the Oregon House is absolutely correct, 41 percent of our total forested land base would be rendered unusable or unmanageable because of NMFS' proposals, and that converts into 3.3 million acres of forest land out of the timber base, and that converts to a total lost value of approximately $25.4 billion in foregone economic opportunities for the State of Oregon. This $25 billion comes directly out of the pockets of our small woodland owners, who have submitted maps to show how NMFS proposals would affect their properties, and in some cases it's up to 75 percent of their land base would be involved in riparian management areas and therefore rendered impossible to manage for timber production....

Statement of Tom Stuart, Board President, Idaho Rivers United

First, let me discuss briefly the value of salmon restoration to our region. It is a huge economic resource for us that I believe is your responsibility as well as mine. As of 1988, the value of sport and commercial salmon fishing in this region accounted for 62,000 jobs, and a $1.2 billion annual contribution to the region's economy.

In Idaho, we don't get a lot of that, but with our remnant steelhead fishery we still have about $90 million worth of contribution annually and 2,700 jobs. We, in the fishing community in Idaho, the business community, have already suffered a great deal with the loss of chinook fishing. We have had no general chinook salmon fishing season in Idaho since 1978, with an estimated loss of about 1,800 jobs and about $60 million per year the result.

In a recent Idaho Statesman article about the little town of Salmon, Idaho, one gentleman was quoted as saying, ``We lost our thriving salmon economy when Lower Granite Dam was built in 1975, and we lose $1 million a week."...

U.S. Senate Subcommittee on Interior and Related Agencies of the Committee on Appropriations and the U.S. House of Representatives Subcommittee On Interior Committee on Appropriations (Joint Hearing), “Special Hearing Northwest Salmon Recovery”, April 7, 1999.

Prepared Statement of Bill Wilkerson, Washington Forest Protection Association

My name is Bill Wilkerson and I am Executive Director of the Washington Forest Protection Association in Olympia, Washington. Our board is composed of large and small forest landowners who own or represent about 8 million acres of private forestland in Washington State.

I appreciate the opportunity to report to you today about a positive solution that has been developed to meet salmon recovery needs on private forest lands in our state. After nearly

two years of work, five diverse groups with a stake in salmon recovery successfully negotiated a science-based agreement that will protect fish habitat and water quality on more than 60,000 miles of streams on private land. Now called the Forests and Fish plan, the agreement is part of Governor Gary Locke's statewide salmon recovery strategy.

The Forests and Fish plan meets the requirements of both the federal Endangered Species Act and Clean Water Act, an historic first. The scientists from the six agencies and the tribes agreed that the Forests and Fish plan is a biologically sound way to protect fish and water on 8 million acres of private forests. The plan will greatly expand forested buffer zones along streams to provide shade, including almost 40,000 miles of non-fish-bearing streams. There are stronger standards for road construction and maintenance, and new protections for steep and potentially unstable slope areas. The agreement also has a rigorous adaptive management section, which will use science to judge future fish and water needs. These and other protections will ensure that forest streams continue to flow with the cool, clear water that fish need.

Because the agreement would cost landowners more than $2 billion in land and timber value in western Washington alone, the Forests and Fish agreement includes an economic incentive package, including a reduction in the state timber tax rate by one percentage point. There also is a compensation plan for small landowners similar to the Conservation Reserve Enhancement Program. With the incentives, the Forests and Fish plan is the only fish protection proposal that allows forestry to continue as a viable part of our state's economy. If private forest land can no longer be managed for economic success, then it will be converted to other uses, and the state would lose valuable open space in addition to habitat for fish and wildlife.

U.S. House of Representatives, Committee on Resources, "Field Hearing On the Enforcement of the Endangered Species Act in California, July 9, 1999.

Discussion point raised by Hon. Duncan Hunter, U.S. Congress, California

Mr. Hunter. Beyond that, the information that I have, and I have talked to some builders, for example, one builder, for example, that built a $185,000 home was making $10,000 profit per unit, but the hard cost of building the home was only $59,000 out of the remaining $175,000, and I said, ``What is the rest of it?"

He said, ``Land and land use regulation." He said all of the consultants you have to hire, the biologists you have to hire, the time you have got to spend working with the Federal agencies and state and local government, which also have their own level of bureaucracy.

So the rest of that, that almost $60,000 out of $175,000 is not building the home at all. It's that little piece of land that it is on and the land use regulation, and the estimates that I have

seen is that we could avoid or lower costs of housing by almost 35 percent in San Diego County if we offset or took away the cost of regulation, land use regulation.

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Appendix E – City of Portland - Urban Impacts

Urban Development: Its Effects on Salmon and Trout

(Adapted from City of Portland 9/99 Document)

In March 1998 the National Marine Fisheries Service (NMFS) listed lower Columbia River steelhead as a threatened species. The listing includes the Willamette River and its tributaries below Willamette Falls. In March 1999, NMFS listed Chinook salmon as a threatened species. In response, the City of Portland is evaluating how all its activities and development regulations affect salmon and trout. The City is also identifying how to avoid, minimize, or mitigate activities that have a negative impact on these fish.

Three Primary Impacts

Salmon and trout are very sensitive to any change in the stream environment and urban development can alter their habitat. Development activities can pollute water, degrade instream and riparian habitat, and alter the natural flow of rivers and streams.

1. Erosion

Erosion can put excessive amounts of sediment into rivers and streams, and can be lethal to salmon and trout. Both species need gravel and rocks to spawn and rear young. Erosion caused by construction introduces fine sediments that clog the spaces between rocks and gravel in streams, buries the eggs salmon and trout lay in these spaces, and prevents flowing water and oxygen from reaching the eggs and newly hatched fish.

Sedimentation can also fill in pools, which are an important part of fish habitat. Salmon and trout use pools for rearing and spawning, as resting areas during migration, and as a refuge to avoid temperature and flow extremes. Sediments in water can damage gills and decrease visibility, which can hamper the fish's ability to find food. Sediments also can carry and store toxic pollutants and nutrients that can poison habitat.

Portland is developing a new system to track and respond to erosion problems. The City is rewriting its erosion control regulations and design manual to improve construction site erosion control and stormwater management. And Portland is exploring methods of improving enforcement of erosion control standards and responding to complaints more effectively.

2. Impervious Surfaces

Parking lots, roofs, roads, and other hard surfaces prevent water from soaking into the ground. As impervious surfaces increase, so do the volume and velocity of stormwater runoff into rivers and streams. Increased volume and velocity cause more erosion and sedimentation, and disturbance to

spawning and resting areas. In undeveloped areas, stormwater can soak into the ground, allowing soil and vegetation to filter out some pollution. In urban areas, the dirt, oil, chemicals, and other pollutants that collect on roads and other hard surfaces wash directly into streams without the benefit of any natural treatment. Impervious surfaces "short circuit" natural watershed cleansing processes. Research shows that when the percentage of impervious surfaces in a watershed exceeds 10 to 15 percent, streams degrade markedly. The diversity of fish and the aquatic insects they eat begins to decline. Sensitive species, such as salmon and trout, may be replaced by fish species that are more tolerant of degraded streams. Good stormwater management can partially offset the impact of impervious surfaces. The amount of impervious sur-face in some Portland area watersheds far exceeds 15 per-cent. But damage to our rivers and streams can be reduced by restoring riparian vegetation, capturing and treating stormwater runoff, and controlling erosion. Portland is developing an improved stormwater design manual and strengthening stormwater drainage regulations to reduce stormwater impacts on rivers and streams.

3. Removal of Riparian Vegetation

The abundance of trees and shrubs that grow alongside stream banks may be the most important key to healthy salmon and trout habitat. Removing this riparian vegetation increases water temperatures, destabilizes stream banks, destroys fish habitat, degrades water quality, and diminishes the food supply. Clearing away streamside trees and shrubs eliminates shade that cools the water. Water temperatures above 59 degrees Fahrenheit can harm salmon and trout by:

- Increasing physical stress,
- Decreasing their ability to compete for food and avoid predators,
- Decreasing oxygen levels in the water while increasing oxygen demand,
- Increasing the toxicity of many contaminants,
- Decreasing rearing habitat.

Water temperatures above 68 degrees Fahrenheit can be lethal to salmon and trout. High stream temperatures may allow carp, suckers, sunfish, and other temperature tolerant species to dominate at the expense of salmon and trout. Riparian trees and branches regularly fall into streams. This large woody debris is extremely important to salmon and trout survival. It provides cover, protection from predators, resting areas, and important habitat for aquatic insects and small fish that salmon and trout eat. Debris dams help form pool areas that are essential to fish habitat. Portland recognizes the importance of streamside trees and shrubs and the City has environmental zoning regulations designed to protect riparian vegetation. Development standards limit the number of trees that can be removed from sensitive areas, require replacement of trees illegally removed, and require new development to be set back from stream banks. Portland is reviewing these regulations and standards with an eye toward strengthening protection of salmon and trout.

What Developers Can Do

Portland can grow, and development can occur, without destroying salmon and trout habitat in the process. Development that minimizes impacts on fish habitat will help the recovery process. Some things developers can do to help preserve salmon and trout habitat are:

- Use state-of-the-art erosion control.
- Cover bare soil at the construction sites with gravel or straw.
- Don't disturb soil during the rainy season.
- Plant native plants, using compost as a soil amendment instead of fertilizing.
- Remove weeds manually rather than using herbicides.
- Reduce the amount of impervious surface in new developments by using porous paving blocks or grass blocks where appropriate.
- Direct roof runoff to landscaped areas, detention ponds, or grassy swales.
- Plant native trees at the construction site.

Appendix F – Portland Metro-Trade Off Analysis- Adapted from "Development of Measures to Conserve, Protect, and Restore Riparian Corridors in the Portland Metro Region" December 1999, Metro Growth Management Services.

Headwater Sites: Economic Consequences

ACTION	EFFECTS ON THE CONFLICTING USE	EFFECTS ON THE RESOURCE
Protect or Partially Protect Resource/**Prohibit or Limit** Conflicting Use	May increase overall property values, and provide economic development incentive that attracts businesses due to amenities such as scenic views, proximity to wildlife and recreation May diminish individual property values due to loss of full expected use (development, agriculture, forestry, aggregate mining) May reduce buildable land supply for jobs and housing resulting in expansion of the UGB May require developers to consider setbacks, transfer of development rights or density transfers May result in the relaxation of the threat of federal actions to protect salmon.	May protect quantity and quality of water supply, reducing cost of treating drinking water May reduce downstream flooding and associated costs May result in increased short-term costs to protect resource (e.g., bridge vs. culvert) May support commercial and recreational fisheries, water storage and assimilation and filtering of wastes May increase the salmon population, which has a great existence value.

ACTION	EFFECTS ON THE CONFLICTING USE	EFFECTS ON THE RESOURCE
No Resource Protection/ **Allow** Conflicting Use	May achieve full expected use of property May result in loss or reduction of economic development incentive or amenity value May allow housing and job projections to be met May result in higher utility installation costs and development costs due to steep slopes	May cause degradation of water quality and costly treatment of drinking water May cause increased flooding downstream due to loss of riparian vegetation plus increased stormwater runoff from impervious surfaces May require costly environmental restoration in the future, particularly for cleanup of landslides and slope stabilization projects May impact downstream commercial and recreational fisheries

Headwater Sites: Social Consequences

ACTION	EFFECTS ON THE CONFLICTING USE	EFFECTS ON THE RESOURCE
Protect or Partially Protect Resource/**Prohibit or Limit** Conflicting Use	May prohibit or limit recreational structures such as trails and other park facilities in the riparian corridor May diminish transportation connectivity, increasing travel time and reducing transportation choices such as biking and walking May increase housing costs by decreasing the supply of land, having a proportionally larger impact on low-income households	May provide recreational and educational opportunities such as fishing, hiking and wildlife viewing May preserve natural resource, providing a variety of landscapes and a visual screen separating incompatible land uses May enhance the urban design and unique character of neighborhoods May reduce downstream flooding and associated human health and safety concerns May protect historic, heritage and cultural values
No Resource Protection/ **Allow** Conflicting Use	May allow recreational structures such as trails and other park facilities in the riparian corridor May allow or enhance opportunities for transportation connectivity May prevent additional increases in housing costs	May reduce recreational and educational opportunities May limit or eliminate variety of landscapes and visual screen separating incompatible land uses May detract from the urban design and unique character of neighborhoods May increase downstream flooding and associated human health and safety concerns May limit or jeopardize historic, heritage and cultural values

Headwater Sites: Environmental Consequences

ACTION	EFFECTS ON THE CONFLICTING USE	EFFECTS ON THE RESOURCE
Protect or Partially Protect Resource/**Prohibit or Limit** Conflicting Use	May decrease land available for open space within clustered development outside the resource May impact nearby flower and vegetable gardens from increased wildlife presence	Provides or may provide fish and wildlife habitat –food, organic matter, water, shelter, nesting, protection from predators Important source or potential source of large woody debris, which provides instream structure and aquatic habitat Provides or may provide travel and migration corridor for fish and wildlife Stabilizes or may stabilize streambanks and controls sediment, reducing excessive erosion and soil loss that degrades downstream spawning habitat Shades or may shade stream, helping to maintain cooler water temperature critical to survival of coldwater fish such as salmon and trout Benefits or may benefit water quality by filtering excess nutrients and contaminants and moderating stormwater flows Supports the integrity of a natural system and the function of the hydrologic cycle May protect degraded areas for future restoration

ACTION	EFFECTS ON THE CONFLICTING USE	EFFECTS ON THE RESOURCE
No Resource Protection/ **Allow** Conflicting Use	May allow access for flood control and stormwater detention facilities	May degrade and/or destroy fish and wildlife habitat by removing vegetation, adding impervious surfaces, modifying stream channels, etc. May reduce the amount of LWD and organic matter entering the stream May cause fragmentation of riparian corridor due to road crossings, culverts, etc. May cause higher water temperature in streams May cause increased flooding downstream due to increased volume and velocity of stormwater runoff May cause landslides, erosion, mass wasting May cause negative water quality and quantity effects from increased sedimentation, contaminants, etc. May result in wildlife mortality due to roads and traffic May degrade native vegetation due to non-native, invasive vegetation from adjacent development May disturb sensitive wildlife due to noise (automobiles, lawn mowers, etc.) and light from adjacent development

Headwater Sites: Energy Consequences

ACTION	EFFECTS ON THE CONFLICTING USE	EFFECTS ON THE RESOURCE
Protect resource/**Prohibit** conflicting use	May limit stream/road crossings, reducing transportation connectivity and requiring longer vehicle trips and higher fuel consumption May increase travel distances due to UGB expansion, which could result from a reduction of the buildable land supply	May help reduce energy used for cooling and heating by providing shade and absorbing heat in the summer and providing shelter from winter winds and storms.
No resource protection/**Allow** conflicting use	May enhance transportation connectivity by allowing stream/road crossings	May require more energy for cooling and heating due to removal of riparian vegetation

Mid Section Sites: Economic Consequences

ACTION	EFFECTS ON THE CONFLICTING USE	EFFECTS ON THE RESOURCE
Protect or Partially Protect Resource/**Prohibit or Limit** Conflicting Use	May increase overall property values, and provide economic development incentive that attracts businesses due to amenities such as scenic views, proximity to wildlife and recreation May diminish individual property values due to loss of full expected use (development, agriculture, forestry, and aggregate mining) May reduce buildable land supply for jobs and housing resulting in expansion of the UGB May require developers to consider setbacks, transfer of development rights or density transfers May preclude use of existing infrastructure May result in the relaxation of the threat of federal actions to protect salmon.	May protect quantity and quality of water supply, reducing cost of treating drinking water May reduce downstream flooding and associated costs May result in increased short-term costs to protect resource (e.g., bridge vs. culvert) May support commercial and recreational fisheries, water storage and assimilation and filtering of wastes May increase the salmon population, which has a great existence value.

ACTION	EFFECTS ON THE CONFLICTING USE	EFFECTS ON THE RESOURCE
No Resource Protection/**Allow** Conflicting Use	May achieve full expected use of property May result in loss or reduction of economic development incentive or amenity value May allow housing and job projections to be met May permit use of existing infrastructure	May cause degradation of water quality and costly treatment of drinking water May cause increased flooding downstream due to loss of riparian vegetation plus increased stormwater runoff from impervious surfaces May require costly environmental restoration in the future May impact downstream commercial and recreational fisheries

Mid Section Sites: Social Consequences

ACTION	EFFECTS ON THE CONFLICTING USE	EFFECTS ON THE RESOURCE
Protect or Partially Protect Resource/**Prohibit or Limit** Conflicting Use	May prohibit or limit recreational structures such as trails and other park facilities in the riparian corridor and associated floodplain May diminish transportation connectivity, increasing travel time and reducing transportation choices such as biking and walking May increase housing costs by decreasing the supply of land, having a proportionally larger impact on low-income households	May provide recreational and educational opportunities such as fishing, hiking and wildlife viewing May preserve natural resource, providing a variety of landscapes and a visual screen separating incompatible land uses May enhance the urban design and unique character of neighborhoods May reduce downstream flooding and associated human health and safety concerns May protect historic, heritage and cultural values
No Resource Protection/**Allow** Conflicting Use	May allow recreational structures such as trails and other park facilities in the riparian corridor and associated floodplain May allow or enhance opportunities for transportation connectivity May prevent additional increases in housing costs	May reduce recreational and educational opportunities May limit or eliminate variety of landscapes and visual screen separating incompatible land uses May detract from the urban design and unique character of neighborhoods May increase downstream flooding and associated human health and safety concerns May limit or jeopardize historic, heritage and cultural values

Mid Section Sites: Environmental Consequences

ACTION	EFFECTS ON THE CONFLICTING USE	EFFECTS ON THE RESOURCE
Protect or Partially Protect Resource/**Prohibit or Limit** Conflicting Use	May decrease land available for open space within clustered development outside the resource May impact nearby flower and vegetable gardens from increased wildlife presence	Provides or may provide fish and wildlife habitat – food, organic matter, water, shelter, nesting, spawning and rearing beds, protection from predators Source or potential source of large woody debris, which provides instream structure and aquatic habitat Provides or may provide travel and migration corridor for fish and wildlife Maintains important stream-floodplain connection Stabilizes or may stabilize streambanks and controls sediment, reducing excessive erosion and soil loss that degrades downstream spawning habitat Shades or may shade stream, helping to maintain cooler water temperature critical to survival of coldwater fish such as salmon and trout Benefits or may benefit water quality by filtering excess nutrients and contaminants and moderating stormwater flows Supports the integrity of a natural system and the function of the hydrologic cycle May protect degraded areas for future restoration

ACTION	EFFECTS ON THE CONFLICTING USE	EFFECTS ON THE RESOURCE
No Resource Protection/**Allow** Conflicting Use	May allow access for flood control and stormwater detention facilities	May degrade and/or destroy fish and wildlife habitat by removing vegetation, adding impervious surfaces, modifying stream channels, etc. May reduce the amount of large woody debris and organic matter entering the stream May cause fragmentation of riparian corridor due to road crossings, culverts, etc. May eliminate important stream-floodplain connection May cause higher water temperature in streams May cause increased flooding downstream due to increased volume and velocity of stormwater runoff May cause negative water quality & quantity effects from increased sedimentation, contaminants, etc. May result in wildlife mortality due to roads and traffic May degrade native vegetation due to non-native, invasive vegetation from adjacent development May disturb sensitive wildlife due to noise (automobiles, lawn mowers, etc.) and light from adjacent development

Mid Section Sites: Energy Consequences

ACTION	EFFECTS ON THE CONFLICTING USE	EFFECTS ON THE RESOURCE
Protect resource/**Prohibit** conflicting use	May limit stream/road crossings, reducing transportation connectivity and requiring longer vehicle trips and higher fuel consumption May increase travel distances due to UGB expansion, which could result from a reduction of the buildable land supply	May help reduce energy used for cooling and heating by providing shade and absorbing heat in the summer and providing shelter from winter winds and storms.
No resource protection/**Allow** conflicting use	May enhance transportation connectivity by allowing stream/road crossings	May require more energy for cooling and heating due to removal of riparian vegetation

Floodplain Stream/River Sites: Economic Consequences

ACTION	EFFECTS ON THE CONFLICTING USE	EFFECTS ON THE RESOURCE
Protect or Partially Protect Resource/**Prohibit or Limit** Conflicting Use	May limit or prohibit location-dependent businesses that require access to rivers, such as ports and marine-related industry May increase nearby property values, and provide economic development incentive that attracts businesses due to amenities such as scenic views, proximity to wildlife and recreation May diminish individual property values due to loss of full expected use (development, agriculture, forestry, and aggregate mining) May lose ability to make use of existing infrastructure (sewer, roads, rail and water) May reduce buildable land supply for jobs and housing resulting in expansion of the UGB May require developers to consider setbacks, transfer of development rights or density transfers May result in the relaxation of the threat of federal actions to protect salmon.	May protect quantity and quality of water supply, reducing cost of treating drinking water May result in increased short-term costs to protect resource (e.g., bridge vs. culvert) May support commercial and recreational fisheries, water storage and assimilation and filtering of wastes May increase the salmon population, which has a great existence value.

ACTION	EFFECTS ON THE CONFLICTING USE	EFFECTS ON THE RESOURCE
No Resource Protection/ **Allow** Conflicting Use	May allow water-dependent uses such as port facilities and marinas May achieve full expected use of property May result in loss or reduction of economic development incentive or amenity value May allow housing and job projections to be met May benefit from maximizing efficiencies of existing infrastructure	May cause degradation of water quality and costly treatment of drinking water May reduce floodplain causing increased flooding and costly cleanup of property damage May require costly environmental restoration in the future May negatively impact commercial and recreational fisheries

Floodplain Stream/River Sites: Social Consequences

ACTION	EFFECTS ON THE CONFLICTING USE	EFFECTS ON THE RESOURCE
Protect or Partially Protect Resource/**Prohibit or Limit** Conflicting Use	May prohibit or limit recreational structures such as trails and other park facilities in the riparian corridor May diminish transportation connectivity, increasing travel time and reducing transportation choices such as biking and walking May increase housing costs by decreasing the supply of land, having a proportionally larger impact on low-income households	May provide floodplain management benefits, reducing risks to human health and safety May provide recreational and educational opportunities such as fishing, hiking and wildlife viewing May preserve natural resource, providing a variety of landscapes and a visual screen separating incompatible land uses May enhance the urban design and unique character of neighborhoods May protect historic, heritage and cultural values

ACTION	EFFECTS ON THE CONFLICTING USE	EFFECTS ON THE RESOURCE
No Resource Protection/ **Allow** Conflicting Use	May allow recreational structures such as trails and other park facilities in the riparian corridor May allow or enhance opportunities for transportation connectivity May prevent additional increases in housing costs	May reduce floodplain resulting in human health and safety risks May reduce recreational and educational opportunities May limit or eliminate variety of landscapes and visual screen separating incompatible land uses May detract from the urban design and unique character of neighborhoods May limit or jeopardize historic, heritage and cultural values

Floodplain Stream/River Sites: Environmental Consequences

ACTION	EFFECTS ON THE CONFLICTING USE	EFFECTS ON THE RESOURCE
Protect or Partially Protect Resource/**Prohibit or Limit** Conflicting Use	May decrease land available for open space within clustered development outside the resource May impact nearby flower and vegetable gardens from increased wildlife presence	Provides or may provide fish and wildlife habitat – food, organic matter, water, shelter, nesting, protection from predators May provide important spawning, rearing, migration, and overwintering for anadromous fish and spawning, rearing, and overwintering for resident fish Provides important year-round habitat for turtles, amphibians, beaver, and muskrat; also foraging habitat for many mammals and bird species May provide important connection to floodplain habitat such as oxbows, backwaters, undercut banks, etc. Benefits or may benefit water quality by filtering excess nutrients and contaminants and moderating stormwater flows Supports the integrity of a natural system and the function of the hydrologic cycle May protect degraded areas for future restoration

ACTION	EFFECTS ON THE CONFLICTING USE	EFFECTS ON THE RESOURCE
No Resource Protection/**Allow** Conflicting Use	May allow access for flood control and stormwater detention facilities	May degrade and/or destroy fish and wildlife habitat by removing vegetation, adding impervious surfaces, modifying stream channels, etc. May cause fragmentation of riparian corridor due to road crossings, culverts, etc. resulting in blockage of fish and wildlife migration routes May cause increased flooding due to loss of floodplain and increased volume and velocity of stormwater runoff May cause negative water quality & quantity effects from increased sedimentation, contaminants, etc. May result in wildlife mortality due to roads and traffic May degrade native vegetation due to non-native, invasive vegetation from adjacent development May disturb sensitive wildlife due to noise (automobiles, lawn mowers, etc.) and light from adjacent development

Floodplain Stream/River Sites: Energy Consequences

ACTION	EFFECTS ON THE CONFLICTING USE	EFFECTS ON THE RESOURCE
Protect resource/ **Prohibit** conflicting use	May limit stream/road crossings, reducing transportation connectivity and requiring longer vehicle trips and higher fuel consumption May increase travel distances due to UGB expansion, which could result from a reduction of the buildable land supply	May not allow for the construction of dams needed for hydroelectric power production on rivers May help reduce energy used for cooling and heating by providing shade and absorbing heat in the summer and providing shelter from winter winds and storms.
No resource protection/ **Allow** conflicting use	May enhance transportation connectivity by allowing stream/road crossings	May allow for the construction of dams May require more energy for cooling and heating due to removal of riparian vegetation

Appendix G – Statement by CalTrout

NATIONAL TREASURE
Statement by CalTrout

Prompt restoration of California steelhead populations will provide a multitude of benefits to California's citizens.

A Vitalized Economy

Restoring steelhead populations will provide a valuable boost to California's economy from our fastest growing economic segment -- tourism and recreation.

Consider the following:

A recent U.C. Berkeley economic analysis valued the direct and indirect economic contribution of California sport fishing at $12 billion annually. Similar analyses by state agencies have valued an individual returning adult steelhead at $75 to $300.00.

In 1993 77,479 Steelhead Catch Report Cards were sold with state fishing license. A USFS (United States Forest Service) study indicates an economic value of $150 per angler day. If each angler fished only one day, that's an $11.6 million contribution.

The doubling of California's steelhead population by the year 2000, a goal established in SB 2261 (1988 legislation), would mean an estimated annual contribution of $37 - $150 million annually to the State's economy from sport fishing alone.

Destination angling is a multi-billion dollar industry. Each year anglers spend considerable sums to travel the globe. Often the trip is in search of steelhead. In the 1930's, the Eel River was considered California's premier steelhead river. Now, given the declines of Eel River runs, the Smith River holds this distinction. The Smith beckons anglers with its pristine habitat and abundant steelhead.

Better habitat and more fish draw more people spending more money at hotels, restaurants, tackle shops, on guide services, at gas stations, and so on. Prompt restoration will mean prompt recovery and sustained economic value for depressed coastal economies.

A Vitalized Ecology

Wild steelhead are an extremely important component of California's diverse wildlife heritage. Their decline is but one aspect of the statewide decline in biodiversity. A burgeoning human population is placing ever-increasing demands on our natural resources. California's ecological well-being is in jeopardy. In terms of aquatic life alone we lead the nation in species loss or imperilment; two-thirds of our native fish species are either extinct or declining.

This is a grim picture. But restoration of steelhead populations offers a ray of hope and a very real possibility for ecological recovery. Because they require clear, clean and cool water, and use all portions of a river system, steelhead are an excellent indicator of the health of oceans, rivers, and adjacent areas. Healthy steelhead populations mean a healthy coastal ecology.

A Better Quality of Life

As the demands and pressures of modern living intensify so does the need for soothing experience. Our environment is a key element in our quality of life. A healthy environment provides more opportunities for quality recreational experiences -- not limited to angling. Restoring our steelhead runs means more money for our economy and a revived ecology. Steelhead are an important ingredient in the quality of life for all California citizens.

Adapted from: CalTrout State Headquarters
870 Market Street, #1185
San Francisco, CA 94102
http://www.caltrout.org/steelhead/treasure.htm

Appendix H – NWPPC Discussion On Passive Use

Adapted from: NWPPC, 2000. Human Effects Analysis of the Multi-Species Framework Alternatives-Phase II Final Report, Northwest Power Planning Council. (pp. 4-10).

> "It is generally accepted that the preservation of species and other natural attributes have human value above and beyond any use of them. Passive use value is defined as economic value unrelated to the use of a good or attribute. Passive use may include existence values, option values, and stewardship values... In the case of endangered species, passive use values are the benefits that citizens associate with the continued existence of the species or increased probability of recovery. Economic quantification is difficult, however, even if probabilities of recovery could be quantified....
>
> Evidence from contingent value studies and analysis of the revealed preference of voters suggests that these values are large. Several studies have queried citizens about the value of anadromous fish population increases in the region. Olsen et al. (1991) used a telephone interview of Northwest households with an open-ended question format. Residents were asked to state their willingness to pay increased power bills for a doubling of salmon from 2.5 million to 5 million fish, for a net change of 2.5 million salmon. The study determined that the amount residents would be willing to pay was $32.52 per household per year in 1996 dollars (about $35 in 1998 dollars). Currently, there are more than 4 million households in the region, so the total passive use value to all regional residents would be about $130 million annually.
>
> Loomis (1996) used a mail questionnaire and a dichotomous choice format to value salmon recovery from breaching a dam in the Elwha River. Respondents were told that the increase in salmon population due to dam removal would be approximately 300,000 fish. The average stated value was $76.46 annually in 1996 dollars per household (about $82 in 1998 dollars). The value to the rest of U.S. residents was quite similar, at $71.24 in 1996 dollars (about $75 in 1998 dollars).
>
> A recent study by Layton, Brown, and Plummer (LBP, 1999) asked Washington residents to value migratory fish population increases in eastern Washington and the Columbia Basin under two conditions. The low status quo condition showed fish populations declining during the next 20 years at the same rate as the previous 20 years. In the high status quo condition, populations stabilized at current levels during the next 20 years. The authors estimated two willingness to pay functions, one corresponding to each of the two status quo conditions. The estimates of willingness to pay for increases in each type of fish population depend on the baseline and the size of the increment.
>
> To illustrate their results, the authors computed the value estimates that correspond to two scenarios. Under the high status quo condition, the study estimated that each Washington household would pay $140 annually for a doubling of eastern Washington and Columbia Basin migratory fish populations from 2 million to 4 million fish in 20 years. Under the

low status quo condition, each Washington household would be willing to pay $332 annually for an increase from 0.5 million to 2.0 million fish. Extrapolating to all households in the state (about 2 million) would result in a value of $280 million and $664 million annually, respectively. For the entire region (about 4 million households) the value would be about double this amount.

The Independent Economic Advisory Board (1999) noted that LBPs method should provide estimates of values that represent total economic value (recreational, existence, option value, etc.) rather than non-use value alone. Results from LBP therefore should not be added to the net benefits from recreation studies.

These studies substantiate the large economic value placed on increased salmon populations, but difficulties arise in how they might be extrapolated across scenarios (the Framework alternatives in particular) and to different groups of people and types of fish.

The studies suggest that willingness to pay is not strongly affected by population numbers. The values per household per year across the three studies ; $35, $82, and $140, are much different when expressed as value per household per fish; $1.40, $27.33, and $7 per 100,000 fish; respectively. People may experience a diminishing marginal willingness to pay to recover additional numbers of salmon, higher per-fish values for smaller populations might be related to the format of the survey, or the higher recent values may be related to changing public perceptions about endangered fish. Additional difficulties involve extrapolation to residents of other states. Oregon residents may value Columbia Basin salmon runs similarly to Washington residents, but what about residents of Idaho, Montana, or California? Some studies (Hanemann et al., 1991; Loomis, 1996) have found that residents of more distant states actually have passive use values for salmon similar to residents of the state in which the salmon run.

Extrapolation among species, runs, and regions (benefits transfers) is not straightforward. The IEAB (1999) noted that extrapolation of results from one or a few salmon runs to all salmon runs in the region could imply that residents would be willing to give up a significant share of their income to recover just salmon, not to mention the many other species needing assistance.

Another problem involves the composition of increased fish populations. The alternatives vary substantially in terms of what fish populations would be augmented and by how much. In particular, the alternatives vary substantially in their shares of hatchery and natural fish in the chinook population. None of the available contingent valuation studies makes this distinction. What are the passive use values for hatchery fish compared to natural fish? Increases to endangered stocks versus healthy stocks? What are the relative values for small and large population increases? These questions have not been addressed by the available contingent valuation studies.

The region has committed substantial resources to recovery of endangered fishes. Do the contingent value surveys suggest that residents are now willing to spend more, or is the value of recovery already reflected in the costs of endangered species management and environmental enhancement in the region? Finally, preservation of traditional lifestyles, such as family farming, also may have passive use values for the public. These values have not been measured, but they might offset some of the natural preservation value."

INITIAL REGULATORY FLEXIBILITY ANALYSIS THREATENED STEELHEAD

I. Introduction and Executive Summary

When an agency proposes regulations, the Regulatory Flexibility Act (RFA) (5 U.S.C. § 601-612) requires the agency to prepare and make available for public comment an initial regulatory flexibility analysis (IRFA) that describes the impact of the proposed rule on small businesses, nonprofit enterprises, local governments, and other small entities. The IRFA is to aid the agency in considering all reasonable regulatory alternatives that would minimize the economic impact on affected small entities.

This analysis addresses proposed regulations associated with the following seven steelhead populations- Environmentally Significant Units (ESUs) listed as "threatened" under the provisions of the Endangered Species Act:

Snake River (SR)
Middle Columbia River (MCR)
Lower Columbia River (LCR)
Upper Willamette River (UWR)
Central California Coast (CCC)
California Central Valley (CCV)
South Central California Coast (SCCC)

Under § 4(d) of the Endangered Species Act (ESA), the Secretary of Commerce (Secretary) is required to adopt such regulations as he deems necessary and advisable for the conservation of species listed as threatened. For the above seven threatened steelhead ESUs, NMFS proposes to apply the prohibitions enumerated in § 9(a) of the ESA. These prohibitions would apply generally to activities affecting listed steelhead in those ESUs, but not to specified categories of activities that contribute to conserving listed steelhead or are governed by a program that limits impacts on listed steelhead to an extent that makes additional protection through federal regulation unnecessary.

The number of entities potentially affected by these regulations is substantial and the geographic range of these regulations crosses four states. Activities potentially affecting steelhead are those associated with agriculture, forestry, fishing, mining, heavy construction, highway and street construction, logging, wood and paper mills, water transportation, electric services, and other industries. As many of these activities involve local, state, and Federal oversight, including permitting, governmental activities associated with the smallest towns or planning units to the largest cities will also be impacted. The activities of some nonprofit organizations will also be affected by these regulations.

The geographic scope of the steelhead ESUs, and thus, the scope of proposed regulations can be approximated through the following list of counties:

Washington: Franklin, Garfield, Whitman, Asotin, Lewis, Cowlitz, Clark, Skamania, Klickitat, Yakima, Kittitas, Benton, Walla Walla, Columbia

Oregon: Union, Wallowa, Columbia, Multnomah, Hood River, Umatilla, Grant, Wheeler, Morrow, Gilliam, Sherman, Jefferson, Wasco, Washington, Clackamas, Marion, Linn, Benton, Polk, Yamhill

California: Mendocino, Sonoma, Marin, Napa, Solano, Contra Costa, San Mateo, Alameda, Santa Cruz, San Francisco, Monterey, San Luis Obispo, Santa Clara, San Benito, Shasta, Tehama, Plumas, Glenn, Butte, Sierra, Colusa, Yuba, Nevada, Sutter, Placer, Yolo, El Dorado, Sacramento, Amador, Calaveras, San Joaquin, Stanislaus, Tuolumne, Mariposa, Merced, Madera, Fresno, Kings, Tulare, Kearn.

Idaho: Latah, Nez Perce, Lewis, Clearwater, Idaho, Adams, Valley, Lemhi, Custer.

If the proposed rule is not expected to have a significant impact on a substantial number of small entities, the RFA allows an agency to so certify the rule, in lieu of preparing an IRFA. NMFS examined in as much detail as practical the potential impact of the regulation on a sector by sector basis. Unavailable or inadequate data leaves a high degree of uncertainty surrounding both the numbers of entities likely to be affected, and the characteristics of any impacts on particular entities. The problem is complicated by differences among entities even in the same sector as to the nature and size of their current operations, contiguity to waterways, individual strategies for dealing with the take prohibitions, etc. Therefore, to ensure a broad consideration of impacts on small entities, NMFS has prepared this IRFA without first making the threshold determination whether this proposed action could be certified as not having a significant economic impact on a substantial number of small entities. Of course, NMFS might determine such certification to be appropriate if established by information received in the public comment period.

There are no record-keeping or reporting requirements associated with the take prohibitions, and therefore it is not possible to simplify or tailor record keeping or reporting to be less burdensome for small entities. However, some programs for which NMFS has found it not necessary to prohibit take involve record keeping and/or reporting to support that continuing determination. NMFS has attempted to minimize any burden associated with programs for which the take prohibitions are not enacted.

In formulating this proposed rule, NMFS considered seven alternative approaches, described in more detail below. NMFS concludes that at the present time there are no legally viable alternative rules that would have less impact on small entities and still fulfill the agency's obligations to protect listed salmonids. The first four alternatives may result in unnecessary impacts on economic

activity of small entities, given NMFS' judgment that a more limited application of those protections would suffice to conserve the species.

If you believe the alternative proposed in this rule will impact your economic activity, please comment on whether there is a preferable alternative (including alternatives not described here) that would meet the statutory requirements of ESA § 4(d). Please describe the impact that alternative would have on your economic activity and why the alternative is preferable.

II. Specific Requirement to Prepare an IRFA

The level of detail and sophistication of the analysis should reflect the significance of the impact on small entities. Under 5 U.S.C., § 603(b) of the RFA, each IRFA is required to address:

- A description of the reasons why action by the agency is being considered;
- A succinct statement of the objectives of, and the legal basis for, the proposed rule;
- A description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply (including a profile of the industry divided into industry segments, if appropriate);
- A description of the projected reporting, record keeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the type of professional skills necessary for preparation of the report or record;
- An identification, to the extent practicable, of all relevant Federal rules that may duplicate, overlap or conflict with the proposed rule;
- A description of any significant alternatives to the proposed rule that accomplish the stated objectives of applicable statutes and that would minimize any significant economic impact of the proposed rule on small entities.

III. Reasons For Considering The Proposed Action

Given the threatened biological status of these seven ESUs of threatened steelhead, NMFS finds that the prohibitions for endangered species are generally necessary and advisable for conservation of the species. Therefore NMFS proposes 4(d) rules that would impose the take prohibitions on activities generally, but would not apply the prohibitions to activities found to be adequately protective of the threatened steelhead or otherwise contributing to conservation of the ESUs. The rules do not require any specific actions by non-Federal agencies, businesses, organizations, or private individuals. Rather, they will impose on entities the responsibility to review their actions and modify or eliminate those actions that otherwise would lead to "take" of threatened species.

Prohibitions on "take" of individuals apply to a multitude of activities that may injure or kill listed steelhead including harvest, hatchery-related actions, or disturbance of habitat. Harm to steelhead can occur through destruction or modification of habitat (whether or not designated as critical) that

significantly impairs essential behaviors, including breeding, feeding, rearing, or migration. The take prohibitions apply only to naturally spawned steelhead and their progeny.

Whether take prohibitions or other protective regulations are necessary or advisable is in large part dependent upon the biological status of the species and potential impacts of various activities on the species. The NMFS has concluded that threatened steelhead are at risk of extinction primarily because their populations have been reduced by a variety of human activities. West Coast steelhead populations have been depleted by both the obvious type of take involved in harvest, as well as take resulting from past and ongoing destruction of their freshwater and estuarine habitats and from past hatchery practices. Therefore it is necessary and advisable in most circumstances to prohibit take of these threatened ESUs, in order to provide for their conservation.

Although state, local and other programs may not be specifically for the conservation of threatened salmonids, many are being modified to provide greater protection to listed salmonids. NMFS concludes that where a program provides sufficient conservation for listed salmonids, it is neither necessary nor advisable to apply take prohibitions to activities governed by those programs. In those circumstances, additional Federal ESA regulation through the take prohibitions is unnecessary because it will not enhance the conservation of the listed ESUs. NMFS also finds that Federal regulation in such circumstances is not the most beneficial use of limited government resources, which are better spent on enforcement where non-Federal conservation measures have not been undertaken.

IV. Objectives and Legal Basis of Proposed Rule

The purpose of the ESA is to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species..." Under the ESA, a 'threatened' species is one that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. To conserve a species is to use all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to the ESA are no longer necessary. When a species is listed, § 7 of the ESA requires Federal agencies to insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat. Section 7 extends protection only against actions that have some nexus to federal agency action, funding, or permitting.

When a species is listed as endangered, § 9 of the ESA makes it illegal for any person subject to the jurisdiction of the United States to "take" any wildlife species listed as endangered. For the purposes of this law, "take" of a species means to harass, harm, pursue, hunt, shoot, wound, kill, trap, or collect (or to attempt any of these), import or export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce. It is also

illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. These § 9(a) protections apply by statute only to endangered species, however.

When a species is listed as threatened, § 4(d)[1] of the ESA provides that the Secretary shall issue such regulations as he deems necessary and advisable to provide for the conservation of the species, including any or all of the prohibitions applicable to endangered species under § 9(a). The purpose of this rule is to provide all necessary and advisable protection for threatened steelhead ESUs, by imposing the take prohibitions. As noted above, there are some programs or categories of activities that contribute to conserving listed steelhead or are governed in a manner that limits impacts on listed steelhead to an extent that makes additional protection through federal regulation unnecessary, and for those activities, NMFS is not imposing the take prohibitions.

This 4(d) rule does not require any specific actions by non-Federal agencies, businesses, organizations, or private individuals. Rather it is the responsibility of individuals, businesses, agencies, and organizations not to "take" endangered or threatened species, once the take prohibitions are in place. NMFS provides guidance and other support to help state and local agencies develop incentive, regulatory, and enforcement programs that effectively promote restoration of the listed population.

V. Analytical Questions and Information Needs

To aid the reader or commenter in understanding the environmental baseline for considering incremental impacts of the rule, NMFS outlines below questions that bear on an assessment of regulations under the Regulatory Flexibility Act.

1. What are the regulations?
2. What constitutes the universe of entities that need to be in compliance with these regulations?
3. What part of this universe is already in compliance, e.g., activities occurring on federal lands, subject to § 7 consultations, or governed by existing laws and regulations such as the Clean Water Act?
4. Remaining entities are the ones likely to be impacted by the steelhead regulations.
5. What activities are these impacted entities likely to curtail, modify, or undertake to be in compliance with these regulations?
6. How many of these entities are small entities?
7. Are there Federal, state, or local programs that may help mitigate these financial impacts?

The proposed rule is likely to have direct impacts on substantial numbers of entities. However, what is unknown is the ability of these entities to adapt by changing the manner in which they operate or in changing their mix of products. The following examples are provided to indicate how the proposed rule may affect some of the various sectors and to aid public comment. NMFS asks

[1] 16 U.S.C. § 1533(d) (1994)

that in commenting on the proposed rule, entities identify any alternative protective regulation that would meet NMFS' statutory responsibilities but have less impact on their economic activity, describe the impact that alternative would have on your economic activity, and describe why the alternative is preferable.

Agriculture: What would this rule mean for a farm growing 160 acres of alfalfa, a commonly grown crop in the Snake River Basin ESU, yielding four tons per acre with a price of alfalfa at $95/ton? Reductions in income could result from reduction in use of pesticides which could affect both yield per acre and quality of product (price), changes in the quantity of and timing of irrigation water, or reductions in acres that could be cropped. Costs of screening irrigation diversions has been estimated to cost from $1,000 to $15,000 for a small farm and, hence, this is another way for a small farm to face increased costs. Are there farming techniques or alternative crops that the farmer could employ to mitigate against this loss of revenue and production?

Forestry: Concern in the forest sector surrounds the riparian buffers that may need protection in order to preserve habitat. (Some of this loss occurs as a result of the listing of the steelhead and not as a result of the 4(d) rule because it occurs on Federal land, or as a result of voluntary forest management habitat preservation measures). Reductions of logging between streams could render the entire area between streams infeasible for logging due to the cost of installing yarding systems for log extraction. How many forest landowners face this type of cost? Do they have alternative uses for the land?

Commercial Fishing: For commercial fishing , NMFS does not anticipate any effects on the commercial fishing industry resulting from the 4(d) rule, though certain practices may require modification.

Small Governments: Small governmental jurisdictions are defined as any government of a district with a population of less than 50,000. Districts may include those servicing irrigation, ports, parks and recreation, sanitation, drainage, soil and water conservation, road assessment, etc. These governmental jurisdictions may be affected in many ways including: additional planning required to modify existing programs, increased construction costs in road building and drainage system construction, losses of recreational revenue in the forms of park entry fees and licensing, increased water management costs, increased need for public education, and increased monitoring and enforcement costs. Water management districts are especially susceptible to impacts because flow alterations may be necessary to aid both spawning and smolt migration. How will this propose rule affect the allocations of water and existing plans? Will new programs for conservation and protection have to undertaken?

VI. Effects of the 4(d) Regulation– Prohibitions and Limitations

Take Prohibitions

Individuals or entities conducting activities that could potentially harm, injure, or kill steelhead and result in violations of this rule should evaluate the likelihood that their particular activity will do so either directly or through alteration of habitat. They may need to alter the activity, obtain an incidental take permit, or otherwise avoid any unauthorized take of listed fish. Some of the activities NMFS believes could "take" listed fish include, but are not limited to:

1. Land-use activities that adversely affect steelhead habitat (e.g., logging, grazing, farming, or road construction particularly when conducted in riparian areas, or in areas susceptible to mass wasting and surface erosion);
2. Destruction or alteration of steelhead habitat (aside from habitat restoration activities), such as removal of large woody debris and "sinker logs" or riparian shade canopy, dredging, discharge of fill material, draining, ditching, diverting, blocking, or altering stream channels or surface or ground water flow;
3. Discharges or dumping of toxic chemicals or other pollutants (e.g., sewage, oil, gasoline) into waters or riparian areas supporting the listed steelhead;
4. Violation of discharge permits;
5. Pesticide applications in violation of Federal restrictions;
6. Interstate and foreign commerce of listed steelhead and import/export of listed steelhead without an ESA permit, unless the fish were harvested pursuant to this rule;
7. Except as provided in the rule, collecting, or handling listed steelhead;
8. Introduction of non-native species likely to prey on listed steelhead or displace them from their habitat;
9. Water withdrawals in areas where important spawning or rearing habitats may be adversely affected, or otherwise altering streamflow when it is likely to impair spawning, migration, or other essential functions;
10. Constructing or maintaining barriers that eliminate or impede a listed species' access to habitat essential for its survival or recovery;
11. Removing, poisoning, or contaminating plants, fish, wildlife, or other biota required by the listed species for feeding, sheltering, or other essential functions;
12. Releasing non-indigenous or artificially propagated individuals into a listed species' habitat;
13. Constructing or operating inadequate fish screens or fish passage facilities at dams or water diversion structures in a listed species habitat;
14. Constructing or using inadequate bridges, roads, or trails on stream banks or unstable hill slopes adjacent or above a listed species' habitat; or
15. Constructing or using inadequate pipes, tanks, or storage devices containing toxic substances, where the release of such a substance is likely to significantly modify or degrade listed species' habitat.

Limits on the Take Prohibitions

As a matter of law, impacts on listed steelhead due to actions in compliance with a permit issued by NMFS pursuant to § 10 of the ESA are not violations of this rule. Section 10 permits may be issued for research activities, enhancement of the species' survival, or to authorize incidental take occurring in the course of an otherwise lawful activity. Likewise federally funded or approved activities for which § 7 consultations have been completed, and which are conducted in accord with all reasonable and prudent measures, terms, and conditions provided by NMFS in a biological opinion and accompanying incidental take statement pursuant to § 7 of the ESA will not constitute violations of this rule. NMFS consults on a broad range of activities conducted, funded or authorized by Federal agencies, including fisheries harvest, hatchery operations, silviculture, grazing, mining, road construction, dam construction and operation, discharge of fill material, stream channelization or diversion.

NMFS has determined that it is neither necessary nor advisable to impose § 9 take prohibitions on certain programs or activities carried out or authorized by state or other governments in the threatened steelhead ESUs, where those activities contribute to conservation of the ESU or are regulated by other entities in a way that is adequately protective of steelhead.

1. Fishery Management Limits on the Take Prohibitions

NMFS believes that recreational fisheries for non-listed steelhead and rainbow trout can have an acceptably limited effect on listed steelhead, as long as state fishery management programs are specifically tailored to protect listed steelhead. Through the proposed rule, NMFS proposes not to impose take prohibitions where states have adequate programs. To qualify for this limit on the take prohibitions a state must have developed a Fishery Management and Evaluation Plan (FMEP) for their respective steelhead and resident species fisheries that adequately limits take of listed steelhead and have entered into a Memorandum of Agreement (MOA) with NMFS to ensure adequate implementation of the FMEP.

NMFS also concludes that carefully designed artificial propagation programs may be consistent with and support protection and conservation of listed steelhead. If a state or federal agency develops a Hatchery and Genetic Management Plan containing specific management measures that adequately limits take of listed steelhead and promote the conservation of the listed ESU, NMFS finds that additional Federal protections through imposition of take prohibitions would be unnecessary for conservation of the listed steelhead.

2. Scientific Research Limits on the Take Prohibitions

In carrying out their fishery management responsibilities in Idaho, Washington, Oregon, and California, the state fishery management agencies conduct or permit a wide range of scientific research activities on various fisheries, including studies on steelhead which occur in the seven listed steelhead ESUs. NMFS finds these activities are vital for improving an understanding of the status and risks facing steelhead and other species in these ESUs, and will provide critical information for assessing the effectiveness of current and future management practices. Therefore the take prohibitions are not imposed on these activities so long as conducted with approval of the respective state in accord with limitations and reporting requirements of the rule.

3. Habitat Restoration Limits on the Take Prohibitions

Certain habitat restoration activities are likely to contribute to conserving steelhead, and NMFS therefore does not propose to impose take prohibitions on such activities so long as they are conducted in accordance with appropriate standards and guidelines. Projects planned and carried out based on at least a watershed-scale analysis and conservation plan, and, where practicable, a sub-basin or basin-scale analysis and plan, are likely to be the most beneficial. The rule therefore provides that § 9(a) take prohibitions will not apply to habitat restoration activities found to be part of, and conducted pursuant to a watershed conservation plan. A state must approve or disapprove watershed conservation plans depending on whether they are formulated in accordance with NMFS-approved state watershed conservation plan guidelines.

This rule also proposes that until approved watershed plans are in place, take prohibitions would not be applied to several habitat restoration activities if carried out in accord with applicable state guidance, and of course with any required reviews or permits. The activities excepted under carefully defined conditions are:

a. Riparian zone planting or fencing
b. Livestock water development off-channel
c. Large wood or boulder placement
d. Correcting road/stream crossings, including culverts, to allow or improve fish passage.
e. Repair, maintenance, or decommissioning of roads in danger of failure.
f. Salmonid carcass placement.

More complex restoration activities such as habitat construction projects or channel alterations require project by project technical review at least until watershed planning is complete. The purpose of this limit on application of the take prohibitions is to enable beneficial habitat restoration activities to continue in the short term until states formulate more comprehensive watershed conservation plan guidelines and plans. After a watershed conservation plan has been approved, only activities conducted pursuant to the plan are within the limit on take prohibitions. If no plan has been approved for a watershed within two years following the effective date of this interim rule, the general § 9(a) take prohibitions of this interim § 4(d) rule apply to individual restoration activities just as to all other habitat-affecting activities.

4. Limit on the Take Prohibitions for Properly Screened Water Diversions

A widely recognized cause of mortality among anadromous fish is operation of water diversions without adequate screening. Juveniles may be sucked or attracted into diversion ditches where they later die from a variety of causes, including stranding. Adult and juvenile migration may be impaired by diversion structures, including push-up dams. Juveniles are often injured and killed through entrainment in pumping facilities or impingement on inadequate screens, where water pressure and mechanical forces are often lethal. Despite long-time recognition of these problems and a multitude of state and Federal approaches to reducing these impacts, large numbers of diversions are not adequately screened and remain a threat, particularly to juvenile salmonids. This rule proposes to recognize those diverters who have provided adequate screening, and encourage others to take that step, by not applying the take prohibitions for those diversions that are properly screened in accord with NMFS' fish screening criteria. The proposed limit on the take

prohibitions applies only to physical impacts on listed fish due to entrainment or similar impacts of the act of diverting. It does not include take that may be caused by instream flow reductions associated with operation of the water diversion facility, nor impacts associated with installation of the stream (dewatering, etc.).

5. Routine Road Maintenance Limit on the Take Prohibitions
The Oregon Department of Transportation (ODOT) is responsible for the extensive existing transportation infrastructure represented by Oregon's state highway system. ODOT maintenance and environmental staff have developed a program that greatly improves protections for listed salmonids with respect to the range of routine maintenance activities, minimizing their impacts on receiving streams. ODOT's program includes its Maintenance of Water Quality and Habitat Guide dated June, 1999 (Guide) and a number of supporting policies and practices. NMFS does not find in necessary or advisable to apply take prohibitions to routine road maintenance work performed consistent with the Guide, because in NMFS' judgement doing so would not increase the level of protection provided for listed steelhead. Activities other than routine maintenance, including new construction, major replacements, or activity for which a Corps of Engineers permit is required, will remain subject to the take prohibitions. Likewise, take prohibitions do apply to any pesticide applications or dust abatement applications associated with road maintenance. Any Oregon city or county desiring that take prohibitions not apply to its routine road maintenance activities must not only commit in writing to apply the measures in the Guide, but also must first enter a memorandum of agreement with NMFS detailing how it will assure adequate training, tracking, and reporting.

6. Portland Parks Integrated Pest Management Limit on the Take Prohibitions
The City of Portland, Oregon, Parks and Recreation (PP&R) operates a diverse system of city parks representing a full spectrum from intensively managed recreation, sport, golf, or garden sites to largely natural, unmanaged parks, including the an extensive, wooded Forest Park. PP&R has been operating and refining an integrated pest management program for 10 years, with a goal of reducing the extent of its use of herbicides and pesticides in park maintenance. As a result of this program, the City has phased out regularly scheduled treatments such as turf spraying to control broadleaf weeds. This has reduced total use of chemical to control broadleaf weeds to less than 15% of its former level. The program's "decision tree" place first priority on prevention of pest (weeds, insects, disease) through policy, planning, and avoidance measures (design and plant selection). Second priority is on cultural and mechanical practices, trapping, and biological controls. Use of biological products, and finally of chemical products, is to be considered last. PP&R's overall program affects only a small proportion of the land base and waterways within Portland, and serves to minimize any impacts on listed salmonids from chemical applications associated with that specific, limited land base.

The PP&R has recently developed special policies to provide extra protections near waterways and wetlands, including a 25 foot buffer zone in which pesticide use is limited to specified products, applied with a hand wand from a backpack sprayer, which utilizes low pressure spray to minimize drift NMFS concludes that PP&R's program provides adequate protection for listed steelhead with respect to the limited chemical use the program entails. NMFS does not find in necessary or

advisable to apply additional Federal protections in the form of take prohibitions to PP&R activities conducted under PP&R's integrated pest management program, because doing so would not increase the level of protection provided for listed steelhead. NMFS therefore does not propose to apply the take prohibitions of this rule to activities within the PP&R program.

7. Limit on the Take Prohibitions for New Urban Density Development

As a general matter, significant new urban scale developments have the potential to degrade steelhead habitat and to injure or kill steelhead through a variety of impacts. Through this proposed rule, NMFS proposes a mechanism whereby jurisdictions can be assured that development authorized within those areas is consistent with ESA requirements and avoids or minimizes the risk of take of listed steelhead.

This rule proposes that NMFS will not apply take prohibitions to new developments governed by and conducted in accord with adequate city ordinances that help conserve anadromous salmonids. Similarly, take prohibitions will not be applied to development consistent with an Urban Reserve Plan that Portland's metropolitan regional government, Metro, has evaluated and approved as in compliance with adequate guidelines. In evaluating adequacy of Metro guidelines or local ordinances NMFS will focus on twelve issues:

a. Siting that avoids sensitive or constrained sites.
b. Avoiding stormwater discharge impacts to water quality and quantity, and to the historic hydrograph characteristics of the watershed.
c. Protection of adequate vegetated riparian buffers along all streams.
d. Avoiding stream crossings by roads wherever possible, and minimizing their impacts.
e. Protecting historic stream meander patterns, flood plains and channel migration zones.
f. Protecting wetlands and surrounding vegetation to maintain wetland functions.
g. Preserving the hydrologic capacity of streams to pass peak flows.
h. Landscaping to reduce need for watering and chemical application.
i. Preventing erosion and sediment run-off during and after construction.
j. Assuring that water supply demands do not impact flows needed for steelhead.
k. Monitoring and maintaining detention basins and similar tools.
l. Providing needed enforcement, funding, monitoring, reporting, and implementation mechanisms.

8. Limit on the Take Prohibitions for Forest Management in Washington

In the State of Washington, discussions among timber industry, tribes, state and federal agencies, and interest groups have led to an April 29, 1999 Forests and Fish Report (FFR) to Governor Locke which provides important improvements in forest practice regulation. It also mandates that all existing forest roads be inventoried for potential impacts on salmonids through culvert inadequacies, erosion, slope failures, and the like, and all needed improvements be completed within 15 years. Because of the substantial detrimental impacts of inadequately sited, constructed or maintained forest roads on salmonid habitat, this feature of the overall FFR provides a significant conservation benefit for listed ESUs in Washington.

Because of the above features NMFS does not propose to apply §9 take prohibitions to non-Federal forest management activity conducted in the State of Washington in compliance with the FFR and forest practice regulations implemented by the Washington Forest Practices Board that are at least as protective of habitat functions as are the regulatory elements of the FFR. These measures will provide a significant level of protection to listed steelhead and contribute to their conservation. Activity associated with pesticide use or undertaken pursuant to alternate plans is not within this limitation and would remain subject to take prohibitions.

Elements of the FFR that provide protections or conservation benefits for salmonids include:

a. Adequate classification of water bodies and broad availability of that information.
b. Maintenance and upgrade of existing as well as new forest roads.
c. Protection for unstable slopes from increased failure and sedimentation to streams.
d. Measures to achieve properly functioning riparian conditions.
e. Adequate monitoring and adaptive management programs.

VII. Number and Description of Affected Small Entities

Based on the expected effects of the 4(d) rule, the following series of subsections enumerate, to the extent practicable, the number and nature of the "small entities" which comprise the commercial sectors, not-for-profit organizations, and governmental jurisdictions and communities that are likely to be affected by this proposed rule. Taken as a whole, these "entities" define the potentially impacted universe for purposes of the IRFA.

The Small Business Administration (SBA), under the Small Business Size Standards, defines whether a business entity is eligible for government programs and preferences reserved for "small business" concerns. Size standards have been established for types of economic activity or industry generally within the Standard Industrial Classification (SIC) System. Rough guidelines are that a small company employs fewer than 500 people and has less than $5,000,000 in annual sales. For purposes of this analysis, since sales information by firm size is not available, small business will be defined to be ones that employ fewer than 500 people. (SBA has undertaken a national analysis of firms that indicates that typically for a given industry or SIC category, ninety percent of firms employ less than 20 people.) Small government entities are defined as those serving populations of 50,000 or less. In some instances this may be an entire county government, or all political subdivisions and public districts within such counties. Most tribal governments will also meet this standard. Identification of "small organizations" is defined as "any nonprofit enterprise that is independently owned and operated and not dominant in its field." These may include irrigation districts, public utilities, agricultural co-ops, etc.

Sectors

1. Agriculture: Agriculture includes both crop and livestock farming and ranching. Some soil disturbing activities are involved in all types of agriculture. Chemicals (fertilizers and pesticides)

are used on cultivated crops and pastures. Some cropland and pasture is irrigated. Use of riparian areas for livestock grazing and some crop production also occurs. Some livestock activities result in concentrated accumulation of animal wastes. All of these activities could potentially be modified or curtailed by farmers and ranchers to avoid "taking" of steelhead. Tillage practices may be modified to minimize soil-disturbing activities. Use of chemicals, such as fertilizers and pesticides, could be modified. Irrigated acreage could be reduced in response to instream flow needs designed to protect habitat. Use of riparian areas for livestock grazing and some crop production could be curtailed. Management of animal wastes could be modified. Management of noxious plants may become more costly. All of these activities could potentially be modified or curtailed in response to the rule, affecting both the costs of production and yield rates, resulting in a change in net farm income. It is likely that some modification or curtailment in agricultural activities will occur as a result of application of take prohibitions.

2. Forestry: Forest management activities typically include site preparation, planting, release, pre-commercial thinning, fertilizing, commercial thinning, and final harvest, with this cycle repeated for each rotation. Within this cycle, there are a number of activities where the common methods used may have to be modified in response to the rule. Several of the activities may involve either construction or re-construction of roads. It is also possible that some harvest methods may have to be modified to lessen the potential amount of soil disturbance. Use of chemicals may also be curtailed, resulting in release activities being modified to use more hand methods instead of chemical methods, and there may be limits on fertilization. In addition to modification of these activities, there may be limits on the land areas where they may be practiced, such as buffer areas around streams. It is likely that some modification or curtailment in forestry activities will occur as a result of the imposition of take prohibitions. Indirect effects from forest products manufacturing activities may result from those changes.

3. Fishing: There are no commercial fisheries for steelhead, but there is recreational fishing by both boat and bank anglers fish for steelhead. Impacts of the prohibitions on take may vary from state to state. Idaho, Washington, and Oregon are developing Fishery Management and Evaluation Plans that are expected to adequately limit incidental take of listed steelhead. Thus, in those states the take prohibitions will likely not apply to ongoing recreational fisheries for non-listed steelhead and resident species. Until such time as the California Department of Fish and Game takes a similar course, recreational fisheries may be considerably curtailed to avoid risk of take of listed steelhead. These impacts could indirectly reduce volume for businesses which service anglers, such as bait shops, outfitters, and marinas.

4. Mining: The most common form of mining potentially affected by the 4(d) rule is sand and gravel. Removal of material from streams may occur in the usual course of this activity, and mining gravel may also result in the production of sediment. Some metal mining also occurs in the various ESUs. Mine wastes may produce both sediments and chemicals. Placer mining and "mini-dredges" present the possibility of streambed disturbance. All of these activities could potentially be modified or curtailed to avoid any substantial risk of "taking" listed steelhead.

5. Construction: Residential development, commercial development, and highway construction may all involve soil-disturbing activities that can produce sediment in runoff. Where steelhead habitat interacts with growth centers, construction activities could potentially be modified or curtailed in response to the prohibitions on take.

Identification of Small Businesses within Listed Steelhead ESU Impact Areas

The Small Business Administration (SBA), under the Small Business Size Standards, defines whether a business entity is eligible for government programs and preferences reserved for "small business" concerns. Size standards have been established for types of economic activity or industry generally within the Standard Industrial Classification (SIC) System. The SIC system assigns four-digit SIC codes to all economic activity within ten major divisions. A full table matching a size standard with each four-digit SIC code is published annually by SBA in the Federal Register. Table 1 shows the SIC codes and the sectors used in this analysis to determine the number of small establishments.

Identification of Small Governments within Listed Steelhead ESU Impact Areas

Small government entities are defined as those serving populations of 50,000 or less. In some instances this may be an entire county government, or all political subdivisions and public districts within such counties. Districts may include those servicing irrigation, ports, parks and recreation, sanitation, drainage, soil and water conservation, road assessment, etc. These governmental jurisdictions may be affected in many ways including: additional planning required to modify existing programs, increased construction costs in road building and drainage system construction, losses of recreational revenue in the forms of park entry fees and licensing, increased water management costs, increased need for public education, and increased monitoring and enforcement costs. Water management districts are especially susceptible to impacts because flow alterations may be necessary to aid both spawning and smolt migration. This may result in reallocations of water, redesigning existing plans, and developing new programs for conservation and protective measures. These small entities are a likely form of small entity to experience significant impacts. Most tribal governments will also meet this standard. When counties have populations greater than 50,000, those municipalities of fewer than 50,000 can be identified using population reports. Other types of small government entities are not as easily identified under this standard, as they are not typically classified by population.

1. SRB ESU: This ESU has at least 17 county governments , at least 45 town and community governments, and several types of district governments.

Table 1
Small Establishments Sectors

SIC	Sector Description
0700	Agricultural Services
0800	Forestry
0900	Fishing
1000	Metal Mining
1400	Non Metallic Mining
1440	Sand & Gravel
1600	Heavy Construction
1610	Highway & Street Construction
2091	Canned & Cured Seafood
2092	Fresh & Frozen Fish
2410	Logging
2420	Sawmills & Planing Mills
2436	Softwood Plywood & Veneer
2610	Pulp Mills
4449	Water Transportation, Freight NEC
4910	Electric Services

2. MCR ESU: Ten of the counties in the ESU impact area have populations of less than 50,000. There are two tribal governments within the ESU impact area, and numerous other types of district governments.
3. CCV ESU: This includes tribal governments, at least 21 town and community governments, and several types of district governments.
4. LCR ESU: This includes tribal governments, at least 3 town and community governments, and several types of district governments.
5. UWB ESU: There are three cities in the ESU with populations of 50,000 or more. All other cities are categorized as small entities. Also, the Grand Ronde Indian Reservation is in the ESU impact area..
6. SCCC ESU: This includes tribal governments, at least 4 town and community governments, and several types of district governments.
7. CCC ESU: This includes tribal governments, at least 21 town and community governments, and several types of district governments.

Identification of Small Organizations within Listed Steelhead ESU Impact Areas

Small organizations are more difficult to categorize. No quantifiable standard, such as number of employees, business receipts, or population is generally available. Identification of "small organizations" is defined as "any nonprofit enterprise that is independently owned and operated and not dominant in its field." These may include irrigation districts, public utilities, agricultural co-ops, etc. Further, depending upon state laws, it may be difficult to distinguish whether a small entity is a government or nonprofit entity. For example, a water supply entity may be a cooperative owned by its members in one case and in another a publicly chartered small government with the assets owned publicly and officers elected at the same elections as other public officials. NMFS encourages comment from any small organization that believes the rule may impact its activities.

Geographic Boundaries for Economic Unit Corresponding to ESU

Counties included in this analysis area were identified using data provided by NMFS on county land area included in the ESU and maps provided by NMFS identifying the boundary of the ESU. If any portion of a county was inside the ESU boundary, the entire county was included in the economic impact area. This approach was used because business activities are not restricted by geographic boundaries. Businesses such as those within the agricultural service sector may work within the ESU, and therefore be affected by the 4(d) rule, though they are physically located outside the ESU. Also, changes in water use for an entity within the ESU could impact small entities outside the ESU through changes in availability of water. In practice, the majority of water use planning and management programs are in place already (see Baseline of Existing Protective Measures), and these have some level of provisions to protect threatened or endangered fish. Counties not inside the ESU boundary, but adjacent to counties within the ESU, were evaluated to determine if there could be possible spillover effects on small entities within those counties.

1. Snake River Basin (SRB) ESU: This inland steelhead ESU occupies the Snake River Basin of southeast Washington, northeast Oregon, and northern Idaho. The Snake River flows through terrain that is warmer and drier on an annual basis than the upper Columbia Basin or other drainages to the north. The ESU is spread over 18 counties in the three states, and the economic unit encompasses those same counties. All counties in the unit are rural; the largest city in the ESU (Walla Walla, Washington) contains fewer than 50,000. The following counties are included in the Snake River Basin ESU impact area: Franklin, Walla Walla, Columbia, Garfield, Whitman, and Asotin (WA); Umatilla, Union, and Wallowa (OR); Latah, Nez Perce, Lewis, Clearwater, Idaho, Adams, Valley, Lemhi, and Custer (ID).residents. No counties outside of the Snake River Basin ESU were found to have spillover effects. For the Snake River Basin approximately 64 % of the land is Federally-owned, 33% is private, 2 % state or local, and less than 1% tribal. Because Federal land management agencies must comply with species protection measures as a result of a species being listed as threatened or endangered, this land will not be affected by the 4(d) rule. However, approximately 35 % of the land in this ESU will be affected by the 4(d) rule.

2. Middle Columbia River (MCR) ESU: This inland steelhead ESU occupies the Columbia River Basin and tributaries from above the Wind River in Washington and the Hood River in Oregon (exclusive), upstream to, and including, the Yakima River, in Washington. Genetic differences between inland and coastal steelhead are well established, although some uncertainty remains

about the exact geographic boundaries of the two forms in the Columbia River. The following counties are included in the Middle Columbia River ESU impact area: Umatilla, Grant, Wheeler, Morrow, Gilliam, Sherman, Jefferson, and Wasco, Oregon; Klickitat, Yakima, Kittitas, Benton, Walla Walla, and Columbia, Washington. No counties outside of the Middle Columbia River ESU were found to have spillover effects. For the Middle Columbia River ESU, 23 percent of the land is Federally-owned, 64 percent private, and the remainder state, local or tribal. Because Federal land management agencies must comply with species protection measures as a result of a species being listed as threatened or endangered, this land will not be affected by the 4(d) rule. The majority of land in the ESU will be affected by the 4(d) rule.

3. Lower Columbia River (LCR) ESU: This coastal steelhead ESU occupies tributaries to the Columbia River between the Cowlitz and Wind Rivers in Washington, inclusive, and the Willamette and Hood Rivers in Oregon, inclusive. Excluded are steelhead in the upper Willamette River Basin above Willamette Falls, and steelhead from the Little and Big White Salmon Rivers in Washington. The following counties are included in the Lower Columbia River ESU impact area: Lewis, Cowlitz, Clark, and Skamania (WA); Columbia, Washington, Multnomah, Hood River, and Clackamas (OR). No counties outside of the Lower Columbia River ESU were found to have spillover effects. For the Lower Columbia River ESU 38% of the land is Federally-owned, 56 percent private, and the remainder state, local or tribal. Because Federal land management agencies must comply with species protection measures as a result of a species being listed as threatened or endangered, this land will not be affected by the 4(d) rule. The majority of land in the ESU will be affected by the 4(d) rule.

4. Upper Willamette River (UWR) ESU: This steelhead ESU occupies the Willamette River and its tributaries, upstream from Willamette Falls to the Calapooia River, inclusive. This is a revision of the proposed ESU boundary, in that NMFS now refines the range of this ESU to exclude rivers upstream of the Calapooia River. Steelhead native to the Upper Willamette River ESU are late-run winter steelhead, but introduced hatchery stocks of summer and early-run winter steelhead also occur in the upper Willamette River. The following counties are included in the Upper Willamette River Steelhead ESU impact area: Washington, Clackamas, Marion, Linn, Benton, Polk, and Yamhill, Oregon. No counties outside of the Upper Willamette River ESU were found to have spillover effects For the Upper Willamette River ESU, 10 percent of the land is Federally-owned, 88 percent private, and the remainder state, local or tribal. Because Federal land management agencies must comply with species protection measures as a result of a species being listed as threatened or endangered, this land will not be affected by the 4(d) rule. The majority of land in the ESU will be affected by the 4(d) rule.

5. Central California Coast (CCC) ESU: This coastal steelhead ESU occupies river basins from the Russian River, Sonoma County (inclusive) to Aptos Creek, Santa Cruz County (inclusive), and the drainages of San Francisco and San Pablo Bays eastward to the Napa River (inclusive), Napa County. The Sacramento-San Joaquin River Basin of the Central Valley is excluded. The ESU area is characterized by very erosive soils in the Coast Range mountains, with precipitation levels lower here than in areas to the north. Elevated stream temperatures (greater than 20 degrees C) are common in the summer. The following counties are included in the Central California Coast ESU

economic impact area: Mendocino, Sonoma, Marin, Napa, Solano, Contra Costa, San Mateo, Alameda, Santa Cruz, Santa Clara, San Francisco. No counties outside of the Central California Coast ESU were found to have spillover effects. For the Central California Coast ESU only 5% of the land is Federally-owned. Some 89 percent is privately owned and the remainder is state, local or tribal. Because Federal land management agencies must comply with species protection measures as a result of a species being listed as threatened or endangered, this land will not be affected by the 4(d) rule. The majority of this land will be affected by the 4(d) rule.

6. California Central Valley (CCV) ESU: The Sacramento and San Joaquin Rivers offer the only migration route to the drainages of the Sierra Nevada and southern Cascade mountain ranges for anadromous fish. The distance from the Pacific Ocean to spawning streams can exceed 300 km, providing unique potential for reproductive isolation among steelhead. Steelhead within this ESU have the longest freshwater migration of any population of winter-run steelhead. The following counties are included in the California Central Valley ESU impact area: Shasta, Tehama, Plumas, Glenn, Butte, Sierra, Colusa, Yuba, Nevada, Sutter, Placer, Yolo, El Dorado, Sacramento, Amador, Calaveras, San Joaquin, Stanislaus, Tuolumne, Mariposa and Merced. Five counties outside the ESU (Madera, Fresno, Kings, Tulare, and Kern) were identified as within the economic impact area of the CCV ESU through potential water supply impacts**.** For the Central Valley ESU, only 8% of the land is Federally-owned, 89 percent private, and the remainder state, local or tribal. Because Federal land management agencies must comply with species protection measures as a result of a species being listed as threatened or endangered, this land will not be affected by the 4(d) rule. The majority of land in the ESU will be affected by the 4(d) rule.

7. South Central California Coast (SCCC) ESU: This coastal steelhead ESU occupies rivers from the Pajaro River, located in Santa Cruz County, (inclusive) to (but not including) the Santa Maria River, San Luis Obispo County. Most rivers in this ESU drain the Santa Lucia Mountain Range, the southernmost unit of the California Coast Ranges. The climate is drier and warmer than in the north, which is reflected in the vegetational change from coniferous forest to chaparral and coastal scrub. The following counties are included in the South-Central California Coast ESU impact area: Santa Cruz, Monterey, San Luis Obispo, Santa Clara, San Benito**.** No counties outside of the SCCC ESU were found to have spillover effects. Approximately 18 percent of the land in the ESU is Federal, 80 percent private, and the remainder state or local. Hence, by far the majority of the land in the ESU will be affected by the 4(d) rule.

Universe--Numbers of Small Businesses

County Business Patterns (CBP) data, published by the U.S. Department of Commerce, are used at the county level to determine the number of firms in each affected sector in each county that meet the SBA small business classification standard. The results of the identification of small entities in counties associated with the various ESUs are presented in Tables 2 and 3. These tables establish an upper limit on the number of small businesses potentially affected by the 4(d) rule. Some of these establishments are a part of a larger entity that does not fit the criteria for a small business. Furthermore, as illustrated by the list of questions in Section V that establish the baseline for which impacts are to be measured., not all of these establishments will be impacted by these steelhead regulations given the presence of other regulations and the limits put on the take prohibitions.

For the sectors examined, all establishments had between 1 and 499 employees except for two heavy construction firms, and two classified under agricultural services. County Business Patterns (CBP) data are used at the county level to determine the number of firms in each affected sector in each county that meet the SBA small business classification standard. The Census of Agriculture was used to identify the number of farms with sales of less than $500,000. Ninety-three percent of total number of farms in the seven ESUs have sales below the SBA threshold of less than $500,000 in sales (see Table 3).

Table 2-Number of Establishments by ESU

Type of Establishment	CCC	SCCC	CCV	LCR	SRB	UWR	MCR
Agricultural Services	2,909	1,158	2,593	875	212	717	278
Forestry	33	13	79	107	24	24	114
Fishing	71	19	15	16	3	7	2
Metal Mining	16	9	24	3	12	4	0
Non-Metallic Mining	46	25	110	44	16	49	12
Sand & Gravel Mining	26	15	63	20	7	22	6
Heavy Construction	562	204	754	326	93	227	104
Highway & Street Construction	176	75	241	99	44	72	36
Logging	75	10	282	368	228	279	180
Sawmills & Planing Mills	36	6	79	91	48	66	27
Softwood Plywood & Veneer	0	0	3	9	2	10	2
Electric Services	24	6	80	33	25	23	25

Table 3-Number of Farms by ESU

ESU	Less than $500,000	$500,000 or More
CCC ESU	8,911	544
CCV ESU	38,776	4,170
SCCC ESU	4,973	591
LCR ESU	9,157	200
SNB ESU	8,551	316
MCR ESU	9,902	530
UWR ESU	12,190	412

VIII. Baseline of Existing Protective Measures

This analysis addresses the incremental economic impacts of the rule on small entities, over and above the baseline conditions established by listing actions and those activities adequately regulated by state and tribal governments which aid in the conservation of the species.

Existing regulations and programs are reviewed below, in an effort to isolate the incremental actions small entities may need to take to avoid "taking" steelhead beyond behavior already required by previous listings of endangered species, by various Federal laws such as the Clean Water Act, various state conservation measures, and any other existing fish and wildlife legislation.

Federal Protection Measures

1. Previous Listings

a. SRB ESU: The Snake River Basin ESU for steelhead has considerable geographic overlap with both the Snake River Fall and Spring/Summer Chinook ESU's, which are currently listed as threatened species. Snake River Spring/Summer and Fall Chinook[2] (59 FR 42529) were previously subject to § 9 take prohibitions under a 4(d) interim rule. In effect, this means that many precautionary actions may already have occurred for a landowner, local government, or small business in the ESU. For example, screening of agricultural water diversions may have occurred in response to the Chinook listing, and therefore lessen the net effects of the steelhead listing. However, Chinook habitat occurs at lower altitudes, and covers a geographic area smaller than steelhead habitat. Consequently, there may be several incremental effects of this interim 4(d) rule for steelhead. Restrictions on stream alteration, however, and the necessity of screening water diversions may already exist as a result of the previous listing.

[2] 59 FR 42529

b. MCR ESU: There are no previous listings for anadromous fish that significantly overlap with the Middle Columbia River ESU for steelhead. Consequently, it is assumed that any actions taken that benefit steelhead conservation have occurred on a voluntary basis, or as a result of a state, local, or tribal conservation effort

c. LCR ESU: There are no previous listings for anadromous fish that significantly overlap with the Lower Columbia River Basin ESU for steelhead. Consequently, it is assumed that any actions taken that benefit steelhead conservation have occurred on a voluntary basis, or as a result of a state, local, or tribal conservation effort.

d. UWR ESU: There are no previous listings for anadromous fish that significantly overlap with the Upper Willamette River ESU for steelhead. However, there is a concurrent listing for chinook in the Upper Willamette River chinook ESU that significantly overlaps with the Upper Willamette River steelhead ESU. Consequently, it is assumed that any actions taken that benefit steelhead conservation will simultaneously be motivated by both listings.

e. CCC ESU: Part of the Central California Coast ESU overlaps with the ESU for Coho Salmon, which was listed as threatened on October 31, 1996 (61 FR 561380). The ESU for steelhead also overlaps the area proposed as threatened for the Chinook salmon. The 4(d) rule governing "take" of Coho is similar to that of the 4(d) interim rule for steelhead. In effect, this means that many precautionary actions may already have been undertaken by a landowner, local government, or small business in the ESU. For example, screening of agricultural water diversions may have occurred in response to the Coho listing, and therefore lessen the net effects of the steelhead listing. However, the habitats do not completely overlap and there may be many incremental effects of this interim 4(d) rule for steelhead. Restrictions on stream alteration however, and the necessity of screening water diversions may already exist as a result of the previous listing.

f. SCCC ESU: There are no previous listings for anadromous fish that would significantly overlap with the South-Central California Coast ESU for steelhead. Consequently, it is assumed that any actions taken that benefit steelhead conservation have occurred on a voluntary basis, or as a result of a state, local, or tribal conservation effort

g. CCV ESU: The Central Valley ESU for steelhead has considerable geographic overlap with the Central Valley ESU for Sacramento Winter-Run Chinook (58 FR 5370302) which has previously been subject to § 9 take prohibitions. In effect, this means that many precautionary actions may already have occurred for a landowner, local government, or small business in the ESU. For example, screening of agricultural water diversions may have occurred in response to the Chinook listing, and therefore lessen the net effects of the steelhead listing. However, Winter-run Chinook habitat occurs at lower altitudes, and covers a geographic area smaller than steelhead habitat. Furthermore, flow alterations that have occurred as a result of the Winter-run Chinook listing affect a different spawning season than steelhead. Consequently there may be several incremental effects of this interim 4(d) rule for steelhead. Restrictions on stream alteration however, and the necessity of screening water diversions may already exist as a result of the previous listing.

2. Section 7 Consultation

Actions with Federal involvement (i.e., authorized, funded, or conducted by a Federal agency) fall under § 7 of the ESA. Section 7 is a very powerful mechanism to avoid activities that jeopardize

listed species or affect critical habitat. Under § 7, Federal agencies must ensure that their actions are not likely to jeopardize the continued existence of the listed species. Activities that jeopardize a species are defined as those actions that "reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery" of the species (See 50 C.F.R. 402.02). Examples of Federal activities that may affect the conservation of steelhead include dam and hatchery operations, marine fishery regulations, Federal land management activities, and Federal licensing and permitting for such actions as forestry and logging, mining, road construction, dam construction, discharge of fill material, stream channelization, and stream diversion. These activities are not affected by the 4(d) prohibitions, as long as § 7 consultation has been completed and such activities are conducted in accordance with any terms and conditions specified by NMFS. Consultations are required automatically after a species is listed. As a result, this economic analysis addresses only the incremental impacts of the proposed 4(d) rule, and excludes the effects on small businesses which may occur at present or in the future as a result of Federal agency policy changes resulting from § 7 consultations.

3. Northwest Forest Plan

The Northwest Forest Plan (NFP) is a Federal management policy with important benefits for steelhead. While the NFP covers a very large area, the overall effectiveness of the NFP in conserving steelhead is limited by the extent of Federal lands and the fact that Federal land ownership is not uniformly distributed in watersheds within the affected ESUs. The extent and distribution of Federal lands limits the NFP's ability to achieve its aquatic habitat restoration objectives at watershed and river basin scales and highlights the importance of complementary salmon habitat conservation measures on non-Federal lands within the subject ESUs.[3]

4. PACFISH

On February 25, 1995, the U.S. Forest Service and Bureau of Land Management adopted Implementation of Interim Strategies for Managing Anadromous Fish-Producing Watersheds in eastern Oregon and Washington, Idaho, and portions of California (known as PACFISH). The strategy was developed in response to significant declines in naturally reproducing salmonid stocks, including steelhead, and widespread degradation of anadromous fish habitat throughout public lands in Idaho, Washington, Oregon, and California, outside the range of the northern spotted owl. Like the NFP, PACFISH is an attempt to provide a consistent approach for maintaining and restoring aquatic and riparian habitat conditions which, in turn, are expected to promote the sustained natural production of anadromous fish. However, as with the NFP, PACFISH is limited by the extent of Federal lands and the fact that Federal land ownership is not uniformly distributed in watersheds within the affected ESUs. Furthermore, PACFISH was designed to be a short-term land management/anadromous fish conservation strategy to halt habitat degradation and begin the restoration processes until a long-term strategy could be adopted through the Interior Columbia River Basin Ecosystem Management Project While final work on ICBEMP

[3] National Marine Fisheries Service, Steelhead Conservation Efforts, A Supplement to the Notice of Determination for West Coast Steelhead Under the Endangered Species Act, August, 1996.

has been delayed, NMFS has consulted with both USFS and BLM on current forest management activities, in order to assure that they will no jeopardize listed steelhead or other salmonids.

5. Habitat Conservation Plans (HCPs)
NMFS and FWS are also engaged in an ongoing effort to assist in the development of multiple species Habitat Conservation Plans (HCPs) for state and privately owned lands in Oregon and Washington. While § 7 of the ESA addresses species protection associated with Federal actions and lands, Habitat Conservation Planning under § 10 of the ESA addresses species protection on private (non-Federal) lands. HCPs are particularly important since well over half of the habitat in the range of the Upper Willamette and Middle Columbia River steelhead ESUs is in non-Federal ownership. The intent of the HCP process is to ensure that any incidental taking of listed species will not appreciably reduce the likelihood of survival of the species, reduce conflicts between listed species and economic development activities, and to provide a framework that would encourage "creative partnerships" between the public and private sectors and state, municipal, and Federal agencies in the interests of endangered and threatened species and habitat conservation.

6. Clean Water Act (CWA)
The Federal Water Pollution Control Act (FWPCA) was originally enacted in 1972 and amended with major provisions by legislation in 1977, 1981, and 1987. It is commonly referred to as the Clean Water Act, the title of the 1977 amendments. The principle objective of the Act is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The FWPCA also establishes a national policy on technology-based effluent standards and limitations and discharge water quality standards. The Environmental Protection Agency (EPA) has been given principle responsibility for administering the FWPCA.

All entities are presently regulated as to the amount of a pollutant that a point source can discharge into the water. The FWPCA requires that all discharges comply with minimum effluent limitations or standards. These requirements presently affect all of the entities considered in this analysis. In January 1998, President Clinton announced a major new clean water initiative designed to speed the restoration of water quality within the nation's watersheds. This new initiative (to be administered by the EPA) will increase the Federal government's support to states in carrying out a watershed approach to clean water. Included within this new initiative will be more stringent requirements regarding water runoff from Federal lands and incentives for private landowners, including providing technical assistance in reducing polluted runoff from agricultural, range, and forest lands.

The Federal CWA is intended to protect beneficial uses, including fishery resources. To date, implementation has not been effective in adequately protecting fishery resources, particularly with respect to non-point sources of pollution. Still, the CWA is part of the baseline scenario, and compliance is assumed for the purpose of considering the impacts of the 4(d).

Section 303(d)(1) (C) and (D) of the CWA requires states to prepare Total Maximum Daily Loads (TMDLs) for all water bodies that do not meet state water quality standards. If a state fails in this responsibility, EPA is required to do so. TMDLs are a method for quantitative assessment of

environmental problems in a watershed and identifying pollution reductions needed to protect drinking water, aquatic life, recreation, and other use of rivers, lakes, and streams. TMDLs may address all pollution sources including point sources such as sewage or industrial plant discharges, and non-point discharges such as runoff from roads, farm fields, and forests. State agencies in Oregon are committed to completing TMDLs for coastal drainages within 4 years and all impaired waters within 10 years. Similarly ambitious schedules are in place or in development for Washington and Idaho. No schedule has been set by the state of California.

The ability of these TMDLs to protect steelhead should be significant in the long term. However, it will be difficult to develop them quickly in the short term and their efficacy in protecting steelhead habitat will be unknown for years to come.

7. Central Valley Project Improvement Act (CVPIA)

The CVPIA is specifically intended to remedy habitat and other problems associated with the construction and operation of the Bureau of Reclamation's (BOR's) Central Valley Project. The CVPIA has two key features related to steelhead. First, it directs the Secretary of the Interior to develop and implement a program that makes all reasonable efforts to double natural production of anadromous fish in Central Valley streams (§ 3406(b)(1)) by the year 2002. This plan, which is called the Anadromous Fish Restoration Program (AFRP), was initially drafted in 1995 and subsequently revised in 1997. Funding has been appropriated since 1995 to implement restoration projects identified in the AFRP planning process. Second, the CVPIA dedicates up to 800,000 acre-feet (AF) of water annually for fish, wildlife, and habitat restoration purposes (§3406(b)(2)) and provides for the acquisition of additional water to supplement the 800,000 AF (§3406(b)(3)). FWS, in consultation with other Federal and state agencies, has directed the use of this dedicated water yield since 1993.

The AFRP addresses six anadromous fish species, including steelhead, identified for restoration in the CVPIA. The revised 1997 plan presents the goals, objectives, and strategies of the AFRP; describes processes the AFRP used to identify, develop, and select restoration actions; and lists actions and evaluations determined at a programmatic level to be reasonable to implement as part of the AFRP. FWS intends to finalize this restoration plan in 1998 following completion of the Programmatic Environmental Impact Statement (PEIS) required by § 3409 of the CVPIA. Additionally, FWS and BOR have released guidelines in the form of two administrative proposals that will provide guidance for several key aspects of the AFRP implementation. A draft administrative proposal regarding the development of the AFRP was released in June 1997. A final administrative proposal on the management of § 3406(b)(2) water and a set of flow-related actions for the next 5 years was released by DOI in November, 1997. These plans will be updated to include new information, consistent with the adaptive management approach described in the AFRP. To make restoration efforts as efficient as possible, the AFRP has committed to coordinate restoration efforts with those by other groups or programs. DOI has committed to working with NMFS, CDFG, and others to coordinate actions in this implementation and recovery plans for anadromous fish and for listed and proposed species under the ESA.

The CVPIA obligated $1.9 million in 1996 for 11 site-specific restoration actions and evaluations authorized by the AFRP, and $9.7 million for over 30 restoration projects in 1997. In 1998, the AFRP's projected budget for habitat restoration activities in the Central Valley is $8.2 million. Continued long term funding of AFRP restoration activities is currently authorized in the CVPIA. An estimated $20 million to $35 million will be spent on AFRP restoration actions per year for 25 years ($500 million to $875 million estimated total), most of which will be closely integrated with funding for activities implemented through the CALFED Bay-Delta Program.

8. CALFED

The second conservation initiative that benefits Central Valley steelhead and other species is the CALFED Program. In June 1994, state and Federal agencies, including NMFS, signed a framework agreement that pledged all agencies would work together to formulate water quality standards to protect the Bay-Delta, coordinate state Water Project and Central Valley Project operations in the Bay-Delta, and develop a long-term Bay-Delta solution that would address ecosystem restoration and other objectives.. The CALFED Program, which began in June 1995, is charged with the responsibility of developing a long-term Bay-Delta solution.

Three types of environmental protection measures are detailed in the Bay-Delta Accord: (1) Control of freshwater outflow in the Delta to improve estuarine conditions in the shallow-water habitat of the Bay-Delta estuary (Category I measures); (2) regulation of water project operations and flows to minimize harmful environmental impacts of water exports (Category II measures); and (3) implementation of projects to address non-flow related factors affecting the Bay-Delta ecosystem, such as unscreened diversions, physical habitat degradation, and pollution (Category III measures). Many of the Category I and II measures identified in the agreement were implemented by a Water Quality Control Plan that was adopted by the state Water Resources Control Board in 1995. Efforts were also initiated to fund and implement Category III non-flow projects beginning in 1995.

The CALFED Program completed Phase I in September 1996 with the identification of problems confronting the Bay-Delta system, the development of a mission statement and guiding principals, and the development of three basic alternative approaches to solving the problems. Currently in Phase II, the CALFED Program has refined the preliminary alternatives and is conducting a comprehensive programmatic environmental review with implementation strategies. In addition to the development of three water conveyance and storage alternatives, the CALFED Program has developed four common programs to resolve regional problems: ecosystems quality, water quality, levee system vulnerability, and water system reliability. A major element of the CALFED Program is the Ecosystem Restoration Program Plan (ERPP) which is intended to provide the foundation for long-term ecosystem and water quality restoration and protection throughout the region. Since adoption of the Bay-Delta Accord, urban water users have contributed approximately $21 million and state Proposition 204 has generated an additional $60 million for Category III non- flow habitat restoration projects. Among the non-flow factors for decline that have been targeted by the Category III program are unscreened diversions, waste discharges and water pollution prevention, impacts due to poaching, land derived salts, exotic species, fish barriers, channel alterations, loss of riparian wetlands, and other causes of estuarine habitat degradation.

Continued funding of CALFED program activities and the Category III program are assured through funds provided by state Proposition 204, Federal funding through the DOI, and contributions by water development agencies under Category III. The total cost for implementing the ERPP component of the long- term CALFED Program has been estimated at $1.5 billion, of which about half should be available through state Proposition 204 bonds and expected Federal appropriations.

Collectively, the CVPIA and CALFED conservation programs have the potential to provide a comprehensive conservation response to the extensive ecological problems facing steelhead and other salmonids in the Central Valley.

In the San Joaquin River Basin of the Central Valley, collaboration between water interests and state and Federal resource agencies, including NMFS, has led to the development of a scientifically based, adaptive fisheries management plan known as the Vernalis Adaptive Management Plan (VAMP). The VAMP will provide environmental benefits for fall-run Chinook salmon smolts in the Delta and lower San Joaquin River and its tributaries, but NMFS expects that the long-term commitment of all participating parties to fully implement the plan will provide ancillary benefits to Central Valley steelhead through improved flow and passage conditions.

NMFS reviewed and evaluated habitat restoration efforts implemented by the CALFED and CVPIA programs to date. Central Valley steelhead have benefitted from improved habitat protection resulting from the placement of new fish screens, modifications of barriers to fish passage, and various habitat acquisition and restoration projects. NMFS believes that the benefits provided by these habitat improvements, and other measures recently implemented, have diminished the risk faced by Central Valley steelhead ESU.

9. EQIP, CRP, WRP, and WHIP

Impacts on entities may be mitigated somewhat by four USDA Natural Resource Conservation Service programs. The Wetlands Reserve Program (WRP), Conservation Reserve Program (CRP), Environmental Quality Incentives Program (EQIP), and Wildlife Habitat Incentives Program (WHIP) all target landowners who bear costs when improving their land for an environmental objective. These programs potentially share costs of moving to best management practices (BMP's), and provide rental monies for easements. Budgets for these programs are limited however, and it cannot be assumed they are guaranteed to be available to all landowners bearing costs.

State Conservation Measures

Various conservation plans and protective measures relevant to the seven ESUs have been implemented at state and local levels. While several of the plans addressed show promise for ameliorating risks facing steelhead, some of the measures have not been implemented. Many of these measures are also geographically limited to individual river basins or political subdivisions, thereby improving conditions for only a small portion of the entire ESU. To the extent possible, this analysis considers existing state and local protective measures as part of the baseline, and excludes their effects from the analysis. However, conservation plans and measures which are

developed in response to the take guidelines of this 4(d) rule can be considered part of the effect of the 4(d) rule.

1. Oregon Conservation Measures

a. Forest Practices Act

The Oregon Forest Practices Act (FPA) was passed in the state legislature in 1971, and has undergone two major revisions in 1986 and in 1991. This act regulates forest operations on private and state lands, and sets standards for reforestation, stream protection, tree retention for wildlife habitat, and protection of scenic corridors. The Board of Forestry enforces the FPA, including through civil penalties. Although modified in 1995 and improved over the previous OFPA, the FPA's implementing rules do not yet adequately protect salmonid habitat. In particular, the current OFPA does not provide adequate protection for the production and introduction of LWD to medium, small and non-fish bearing streams. Small non-fish bearing streams are vitally important to the quality of downstream habitats. These streams carry water, sediment, nutrients, and LWD from upper portions of the watershed. Nonetheless, compliance with the FPA does provide many important protections for salmonid habitat.

b. Agricultural Water Quality Management Practices

Agricultural activity has had multiple and often severe impacts on salmonid habitat. These impacts include depletion of needed flows by irrigation withdrawals; blocking of fish passage by diversion or other structures; destruction of riparian vegetation and bank stability by grazing or cultivation practices; and channelization resulting in loss of side channel and wetland-related habitat (NMFS, 1996b). Historically, the impacts to fish habitat from agricultural practices have not been closely regulated.

The Oregon Department of Agriculture has recently completed guidance for development of agricultural water quality management plans (AWQMPs) (as enacted by State Senate Bill 1010). The guidance focuses on achieving state water quality standards. It is undetermined, however, whether they will adequately address salmonid habitat factors, such as properly functioning riparian conditions. Their ability to address all relevant factors will depend on the manner in which they are implemented. AWQMPs are anticipated to be developed at a basin scale and will include regulatory authority and enforcement provisions. The Healthy Streams Partnership schedules adoption of AWQMPs for all impaired waters by 2001.

c. Oregon Plan for Salmon and Watersheds

In April 1996, the Governor of Oregon completed and submitted to NMFS a comprehensive conservation plan directed specifically at coho salmon stocks on the Coast of Oregon. This plan, termed the Oregon Plan for Salmon and Watersheds (OPSW) (formerly known as the Oregon Coastal Salmon Restoration Initiative) was later expanded to include conservation measures for coastal steelhead stocks (Oregon, 1998). The steelhead supplement provides agency measures designed to counteract specific steelhead factors for decline as identified by the NMFS, including water quality and physical habitat, water quantity, and fish management issues affecting steelhead populations within the state. Among other things, Oregon has committed to

- devise and fund monitoring programs to assess stock status and redirect existing management programs if need be;
- establish a process for setting wild steelhead escapement goals;
- continue to implement marking of all hatchery steelhead; and
- eliminate stocking of hatchery trout in juvenile steelhead rearing habitat.

d. Willamette Restoration Initiative (WRI)

Protecting and restoring fish and wildlife habitat and population levels in the Willamette River Basin, promoting proper floodplain management, and enhancing water quality is the focus of the recently formed Willamette Restoration Initiative (WRI). The WRI creates a mechanism through which residents of the basin are mounting a concerted, collaborative effort to restore watershed health. In addition, habitat protection and improved water quality in the Portland/Vancouver metropolitan areas are getting unprecedented attention from local jurisdictions. The regional government, Metro, recently adopted an aggressive stream and floodplain protection ordinance designed to protect functions and values of floodplains, and natural stream and adjacent vegetated corridors. All jurisdictions in the region must amend their land use plans and implementing ordinances to comply with the Metro ordinance within 18 months. Metro also has a green spaces acquisition program that addresses regional biodiversity, and is giving protection to significant amounts of land, some of it on tributaries to the Willamette River. The city of Portland has identified those activities which impact salmonids and is now using that information to reduce impacts of existing programs and to identify potential enhancement actions. The city will shortly be making significant improvements in its storm water management program, a key to reducing impacts on salmonid habitat.

2. Idaho Conservation Measures

The majority of land area within the Snake River ESU (about 70 percent) is under Federal management; therefore, in most watersheds the State of Idaho's forest practice rules play a lesser role in forest management relative to Federal measures (i.e., PACFISH). Even so, NMFS believes that certain aspects of the State's forest practice rules do not avoid adverse effects to anadromous fish populations or their habitat. Specifically, current riparian buffer width requirements are inadequate, as well as rules which do not prohibit logging on unstable hillsides and landslide prone areas.

The Idaho Department of Fish and Game has adopted and implemented a natural salmonid policy designed to limit hatchery influences on natural, indigenous steelhead. Idaho natural resource and environmental management agencies have also developed a series of policies relating to the restoration of fisheries habitat. These policies include improving state efforts in eliminating non-point sources of water pollution, management of land and water resources, and insuring adequate stream flows for protection of aquatic and riparian resources.

3. Washington Conservation Measures

a. Lower Columbia Steelhead Conservation Initiative (LCSCI)

The State of Washington is currently in the process of developing a statewide strategy to protect and restore wild steelhead and other salmon and trout species. In May 1997 Governor Gary Locke

and other state officials created a Joint Natural Resources Cabinet (Joint Cabinet) consisting of state agency directors from a wide variety of agencies whose activities and constituents influence Washington's natural resources. The goal of the Joint Cabinet is to restore healthy salmon, steelhead, and trout populations by improving those habitats on which the fish rely. The Joint Cabinet's current activities include development of the LCSCI, intended to comprehensively address protection and recovery of steelhead in the Lower Columbia River area. In conjunction with the LCSCI process, industry in the Lower Columbia River ESU sponsored the review and assessment of existing conservation programs in this region (Cramer, 1997). This assessment provided a helpful summary of measures, which if fully implemented and funded, may aid in conserving steelhead in this region.

The scope of the LCSCI includes Washington's steelhead stocks in two transboundary ESUs that are shared by both Washington and Oregon. The LCSCI area includes all of Washington's stocks in the Lower Columbia River ESU. When completed, conservation and restoration efforts in the LCSCI area will form a comprehensive, coordinated, and timely protection and rebuilding framework. Benefits to steelhead and other fish species in the LCSCI area will also accrue due to the growing bi-state partnership with Oregon.

b. Watershed Management Initiatives

The Legislature passed, and Governor Locke signed into law, the Watershed Management Act (ESHB 2514), which provides funding and a planning framework for locally based watershed management. Depending on how selected local governments and water utilities within a watershed decide to use the planning framework provided in ESHB 2514 (i.e., addressing water quality and habitat as well as water quantity), these watershed plans may have an important connection to specific salmon preservation and restoration activities and overall regional salmon recovery initiatives.

The Legislature also passed, and the Governor signed, the Salmon Recovery Planning Act (ESHB 2496), which provides funding and a procedural framework for prioritizing salmon restoration projects within specified areas agreed to by participating county, city, and tribal governments. These restoration efforts will be important components of watershed and regional salmon recovery initiatives.

c. Washington Forest Practice Rules

The Washington Department of Natural Resources implements and enforces the State of Washington's forest practice rules (WFPRs) which are promulgated through the Forest Practices Board. These WFPRs contain provisions that can be protective of steelhead if fully implemented. This is possible given that the WFPR's are based on adaptive management of forest lands through watershed analysis, development of site-specific land management prescriptions, and monitoring. Watershed Analysis prescriptions can exceed WFPR minimums for stream and riparian protection. However, NMFS believes the WFPRs, including watershed analysis, do not provide properly functioning riparian and instream habitats. Specifically, the base WFPRs do not adequately address large woody debris recruitment, tree retention to maintain stream bank integrity and channel networks within floodplains, and chronic and episodic inputs of coarse and fine sediment that maintain habitats that are properly functioning for all life stages of steelhead. However, NMFS believes that if the WFPRs are modified to reflect the April, 1999 Forests and Fish Report, they will provide adequate protection for listed steelhead.

d. Agricultural Water Policy

Washington has not historically regulated impacts of agricultural activity on fish habitat overall, although there are some special requirements in the Puget Sound area, and Department of Ecology is currently giving close attention to impacts from dairy operations. As in Oregon, development of Total Maximum Daily Loads (TMDLs; see earlier discussion) should improve water quality over the long term; the extent to which other habitat impacts will be ameliorated is unknown.

e. Wild Salmonid Policy

Washington has adopted a Wild Salmonid Policy, designed to limit hatchery influences on natural, indigenous steelhead. Sport fisheries are based on marked, hatchery-produced steelhead, and sport fishing regulations are designed to protect wild fish.

4. California Conservation Measures

a. California Department of Forestry and Fire Protection (CDF)

California has a number of agencies which have both direct and indirect effects upon steelhead factors for decline. The CDF enforces the state of California's forest practice rules (CFPRs) that are promulgated through the Board of Forestry (BOF). The CFPRs contain provisions that can be protective of steelhead if fully implemented. However, NMFS believes the CFPRs do not secure properly functioning riparian habitat. Specifically, the CFPRs do not adequately address large woody debris recruitment, streamside tree retention to maintain bank stability, and canopy retention standards that assure stream temperatures are properly functioning for all life stages of steelhead. The current process for approving Timber Harvest Plans (THPs) under the CFPRs does not include monitoring of timber harvest operations to determine whether a particular operation damaged habitat and, if so, how it might be mitigated in future THPs. The CFPR rule that permits salvage logging is also an area where better environmental review and monitoring could ensure better protection for steelhead. For these reasons, NMFS is working to improve the condition of riparian buffers in ongoing habitat conservation plan negotiations with private landowners. For the purpose of baseline definition, the existing programs are assumed to be in place. However, it is likely that additional measures will be necessary to fully protect steelhead.

b. California Department of Fish and Game

The state of California has jurisdiction over recreational fisheries conducted within its inland waters. Inland fishing regulations are promulgated by the California Fish and Game Commission and enforced by the CDFG. In recent years, the state has implemented conservation measures for steelhead including adoption of the Steelhead Restoration and Management Plan, adoption of angling regulation changes throughout the state which it believes provide adequate protection of steelhead populations, and implementation of the Steelhead Trout Catch Report/Restoration Card program. The steelhead report card program has generated funding for steelhead conservation programs throughout the state and has also generated much needed information regarding sport harvest effort and impacts on steelhead. The state is making additional regulatory and management changes to protect steelhead in California, such as minimum size limits for juvenile rainbow trout, zero bag limits, and the increased marking of hatchery produced steelhead.

The state agency has adopted and is implementing natural salmonid policies designed to limit hatchery influences on natural, indigenous steelhead. Sport fisheries are based on marked, hatchery-produced steelhead, and sport-fishing regulations are designed to protect wild fish. While some limits have been placed on hatchery production of anadromous salmonids, more careful management of current programs and scrutiny of proposed programs is necessary in order to minimize impacts on listed species.

c. Agriculture

Private lands, and public lands not administered by the Federal government, are now being addressed by the California Rangeland Water Quality Management Plan (CRWQMP) which was adopted by the state Water Resources Control Board as a voluntary compliance effort in accordance with its Non-point Source Management Plan. The emphasis of the CRWQMP is on outreach and education with assistance from the Natural Resources Conservation Service (NRCS), University of California Cooperative Extension, California Association of Resource Conservation Districts (CARCD), and the California Cattleman's Association. The Best Management Practices (BMPs) contained in the CRWQMP are derived from the NRCS Field Office Technical Guides.

The program encourages rangeland owners to develop and implement ranch plans or other documents detailing their management goals and practices. NRCS and Cooperative Extension provide training in this effort and the NRCS can condition assistance on implementation of the BMPs set forth in the CRWQMP. The Regional Water Control Boards promote implementation of the CRWQMP by also encouraging landowners to develop plans and by requiring ranch plans to be developed and implemented in accordance with the CRWQMP for watersheds listed under § 303(d) of the CWA as requiring the development of TMDLs. NMFS is encouraged by these ongoing efforts. Plans that are consistent with the CRWQMP guidance are likely to result in meeting state water quality standards, but the program is voluntary and it is uncertain to what extent their implementation will contribute to improved habitat conditions and riparian function.

d. Watershed Protection and Restoration Council

In July 1997, California's Governor signed Executive Order W-159-97 that created the Watershed Protection and Restoration Council (WPRC). The WPRC, which is chaired by the Secretary of

Resources, is an umbrella body consisting of all state agencies that have programs addressing anadromous salmonid protection and restoration. Under state law, the WPRC is charged with (1) providing oversight of all state activities aimed at watershed protection and enhancement, including the conservation and restoration of anadromous salmonids in California, and (2) directing the development of a Watershed Protection Program that provides for anadromous salmonid conservation in the state. The WPRC has established a 12-member, multi-disciplinary science review panel to advise it in the development of the watershed protection program. The WPRC is currently in the process of comprehensively reviewing and evaluating existing statewide regulatory and non-regulatory programs protecting anadromous salmonids and their habitat, as well as state and local restoration program efforts that are ongoing or proposed.

e. Watershed Scale Conservation Efforts

Through a variety of cooperative agreements between environmental groups, local interest groups, California Department of Water Resources (CDWR), California Department of Fish and Game (CDFG), school districts, Extension staff, and many concerned parties, at least 10 watershed projects and programs are under way at the local level. These programs provide a variety of benefits to steelhead including improved habitat, improved land management, erosion control, and decreased pollution. A NMFS report by Leslie-Ann Shropshire [4] provides an excellent description of these projects and their effects on steelhead.

X. Reporting, Record Keeping, and Other Compliance Requirements

This rule does not require any reporting, record keeping or other specific actions by non-Federal agencies, organizations, or private individuals. Rather it is the responsibility of individuals, agencies, and organizations not to "take" endangered or threatened species, once the take prohibitions are in place. NMFS provides guidance and technical support to help state and local agencies develop incentive, regulatory, or other programs that avoid or minimize take and effectively promote restoration of the listed population. Some programs for which NMFS has found it not necessary to prohibit take involve record keeping and/or reporting to support that continuing determination. NMFS has attempted to minimize any burden associated with programs for which the take prohibitions are not enacted.

XI. Federal Rules which Duplicate, Overlap, or Conflict with Proposed Rule

The NMFS is not aware of any rules which overlap, conflict or duplicate the proposed 4(d) rule governing "take" of steelhead.

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[4] Shropshire, Leslie-Ann. Characterization of Ongoing Watershed-Scale Conservation Efforts within Four Proposed Steelhead Evolutionarily Significant Units (ESU) in California. NMFS, Southwest Regional Office, Long Beach, CA, August 1997.

XII. Alternatives to the Rule

NMFS has carefully considered whether any legally supportable options for a 4(d) rule might have less impact on small entities. That consideration was taken in the context of NMFS' statutory obligation to promulgate whatever protective regulations are necessary and advisable to provide for the conservation of the steelhead ESUs. The "take" prohibitions, which are the backbone of this rule, essentially constitute a performance standard; the rule does not include specific, prescriptive steps that must be taken by any particular entity.

For the seven threatened steelhead ESUs, NMFS proposes to apply the take prohibitions enumerated in §9(a)(1) of the ESA. These prohibitions would apply to all categories of activities affecting threatened steelhead in those ESUs, except with respect to specified categories of activities that contribute to conserving listed steelhead or are governed by a program that limits impacts on listed steelhead to an extent that makes additional protection through federal regulation unnecessary.

In formulating this proposed rule, NMFS considered several alternative approaches. First, The U.S. Fish and Wildlife Service (USFWS) has a "global" protective regulation for threatened species, through which § 9 take prohibitions are applied automatically to all USFWS threatened species at the time of listing, unless the USFWS opts to provide a "special rule" for a particular threatened species. NMFS has no such global protective regulation, and hence must promulgate 4(d) regulations deemed necessary and advisable for each threatened species. NMFS has considered developing a similar global protective regulation that would apply to all future threatened species listings. Having global take prohibitions in place would make it difficult for NMFS to subsequently "tailor" the prohibitions on take to better fit circumstances, and could create unnecessary burdens on small entities when and if more tailored protections would suffice to conserve the species.

Second, NMFS could issue 4(d) protective regulations with no limits, or only a few limits, on the application of the take prohibitions for relatively uncontroversial activities such as fish rescue/salvage. For example, when NMFS listed Snake River spring/summer chinook and fall chinook (57 FR 14653, 1992) and Central California Coast coho (61 FR 56149, 1996) as threatened, it concurrently applied § 9 prohibitions to those ESUs, with two exceptions. These were for actions within a § 10 permit or other exceptions of the ESA related to endangered species, and to provide a six month window for continued research while researchers sought a § 10 permit. This approach, again, could mean unnecessary burdens on small entities, if more limited protections would suffice to conserve the species. It would not take advantage of the opportunity to streamline ESA compliance mechanisms for acceptable activities using the 4(d) mechanism.

Third, NMFS could enact take prohibitions in combination with detailed prescriptive requirements applicable to one or more sectors of activity. For instance, to protect threatened marine turtles, NMFS has required trawlers to be outfitted with turtle excluder devices meeting detailed design parameters. Although prescriptive requirements applicable to one or more economic sectors may

become necessary in the future for some or all of these ESUs, it is NMFS' judgment that at present tailored (by limiting application of the prohibitions wherever warranted) application of the take prohibitions will be adequate. The take prohibitions afford greater flexibility to entities to determine how they will avoid taking threatened steelhead, and therefore likely imposes fewer economic burdens than would a series of prescriptive requirements.

Fourth, NMFS could issue 4(d) protective regulations similar to the existing interim 4(d) protective regulations for Southern Oregon/Northern California coast coho published in July, 1997 (62 FR 38479). This regulation includes four additional limitations on the extension of the take prohibitions, for (1) harvest plans, (2) hatchery plans, (3) scientific research, and (4) habitat restoration projects, when in conformance with specified criteria. While this is a perfectly viable alternative, it would not give ESA recognition to several programs that provide sufficient protections for the listed steelhead such that Federal protections are not necessary. It would not take full advantage of the opportunity to streamline ESA compliance mechanisms for acceptable activities using the 4(d) mechanism.

Fifth, (the proposed rule approach) NMFS could issue a limited 4(d) protective regulation as in the interim rule, but with recognition of more programs and circumstances in which application of take prohibitions is not necessary and advisable. That is the approach taken in this proposed rule, which limits the take prohibitions for the seven items discussed above, but would also limit application of the take prohibitions for (1) properly screened water diversions; (2) in Oregon, for routine road maintenance by ODOT and possibly cities and counties; (3) for the integrated pest management of the Portland Parks and Recreation Department; (4) for urban density development activities, and (5) for forest management (including timber harvest) in Washington conducted in accordance with requirements of the State's Forests and Fish Report. For several of these categories (harvest, artificial propagation, habitat restoration, and urban development) the regulation is structured so that it allows plans or programs developed after promulgation of the rule to be submitted to NMFS for review under the criteria in the rule. Those programs which meet the proposed criteria would not be subject to the prohibitions on take. This approach would allow programs which are under development at the time of this rulemaking, or new programs within these categories, to be included later.

Sixth, NMFS considered an option earlier advocated by the State of Oregon and others, in which § 9 take prohibitions would not be applied to any activity addressed by the Oregon Plan for Salmon and Watersheds, fundamentally deferring protections to the state. At present, NMFS concludes that doing so would not provide sufficient protections to the listed steelhead. In this rule NMFS proposed not applying the take prohibitions to any sector of activity for which other mechanisms currently provide adequate protection for steelhead and their habitat. NMFS will continue to actively seek to identify any additional categories of activity that are managed or regulated in a way that conserves steelhead. NMFS will give equivalent recognition to other sectors or geographic areas through appropriate Endangered Species Act mechanisms whenever the facts warrant.

Finally, NMFS considered, but rejected, the alternative of enacting no protective regulations for threatened steelhead. That course would leave the ESUs without any protection other than

provided by §7 consultations for actions with some federal nexus. By virtue of the findings upon which the decision to list the ESUs as threatened, identifying broad segments of human activity as major factors in the decline of these steelhead ESUs, NMFS could not support that approach at this time as being consistent with the obligation to enact such protective regulations as are "necessary and advisable to provide for the conservation of" the listed steelhead.

NMFS concludes that at the present time there are no legally viable alternative rules that would have less impact on small entities and still fulfill the agency's obligations to protect listed steelhead.

XIII. Economic Mitigation and Sources of Aid to Small Businesses

In addition to the EQIP, CRP, WRP, and WHIP programs, discussed above, there are many other programs including privately funded programs that small business entities could take advantage of. A very good starting point for finding out about these programs can be found at the following web site: *http://www.4sos.org/*. This the web site for "For the Sake of Salmon" Organization which provides links that provide information on watersheds and advice on watershed restoration and improving water quality. Information on grants, funding sources and an extensive list of funding programs offered by Federal and state governments and private foundations. Links to specific agencies and organizations with funding sites on the web are provided including links to Federal, tribal, state, and local government organizations.

Appendix J – Initial Regulatory Flexibility Analysis for Threatened Chinook, Chum, Coho and Sockeye

INITIAL REGULATORY FLEXIBILITY ANALYSIS
THREATENED CHINOOK, CHUM, COHO AND SOCKEYE

I. Introduction and Executive Summary

When an agency proposes regulations, the Regulatory Flexibility Act (RFA) (5 U.S.C. § 601-612) requires the agency to prepare and make available for public comment an initial regulatory flexibility analysis (IRFA) that describes the impact of the proposed rule on small businesses, nonprofit enterprises, local governments, and other small entities. The IRFA is to aid the agency in considering all reasonable regulatory alternatives that would minimize the economic impact on affected small entities.

This analysis addresses proposed regulations associated with the following seven salmonid populations- Environmentally Significant Units (ESUs) listed as "threatened" under the provisions of the Endangered Species Act:

Oregon Coast (OC) Coho
Puget Sound (PS) Chinook
Lower Columbia River (LCR) Chinook
Upper Willamette River (UWR) Chinook
Hood Canal Summer-Run (HCS) Chum
Columbia River (CR) Chum
Ozette Lake (OZ) Sockeye

Under §4(d) of the Endangered Species Act (ESA), the Secretary of Commerce (Secretary) is required to adopt such regulations as he deems necessary and advisable for the conservation of species listed as threatened. For the above seven threatened salmonid ESUs, NMFS proposes to apply the prohibitions enumerated in §9(a) of the ESA. These prohibitions would apply to all categories of activities affecting listed salmon in those ESUs, except with respect to specified categories of activities that contribute to conserving listed salmonids or are governed by a program that limits impacts on listed salmonids to an extent that makes additional protection through federal regulation unnecessary.

The number of entities potentially affected by these regulations is substantial and the geographic range of these regulations crosses four states. Activities potentially affecting salmonids are those associated with agriculture, forestry, fishing, mining, heavy construction, highway and street construction, logging, wood and paper mills, water transportation, electric services, and other industries. As many of these activities involve local, state, and Federal oversight, including permitting, governmental activities associated with the smallest towns or planning units to the

largest cities will also be impacted. The activities of some nonprofit organizations will also be affected by these regulations.

The geographic scope of the salmonid ESUs, and thus, the scope of proposed regulations can be approximated through the following list of counties:

Washington: Clallam, Clark, Cowlitz, Jefferson, Island, King, Kitsap, Klickitat, Lewis, Mason, Pacific, Pierce, San Juan, Skagit, Skamania, Snohomish, Thurston, Wahkiakum, Whatcom,

Oregon: Benton, Clackamas, Clatsop, Columbia, Coos, Curry, Douglas, Hood River, Lane, Lincoln, Linn, Marion, Multnomah, Polk, Tillamook, Washington, Yamhill

If the proposed rule is not expected to have a significant impact on a substantial number of small entities, the RFA allows an agency to so certify the rule, in lieu of preparing an IRFA. NMFS examined in as much detail as practical the potential impact of the regulation on a sector by sector basis. Unavailable or inadequate data leaves a high degree of uncertainty surrounding both the numbers of entities likely to affected, and the characteristics of any impacts on particular entities. The problem is complicated by differences among entities even in the same sector as to the nature and size of their current operations, contiguity to waterways, individual strategies for dealing with the take prohibitions, etc. Therefore, to ensure a broad consideration of impacts on small entities, NMFS has prepared this IRFA without first making the threshold determination whether this proposed action could be certified as not having a significant economic impact on a substantial number of small entities. Of course, NMFS might determine such certification to be appropriate if established by information received in the public comment period.

There are no record-keeping or reporting requirements associated with the take prohibitions, and therefore it is not possible to simplify or tailor record keeping or reporting to be less burdensome for small entities. However, some programs for which NMFS has found it not necessary to prohibit take involve record keeping and/or reporting to support that continuing determination. NMFS has attempted to minimize any burden associated with programs for which the take prohibitions are not enacted.

In formulating this proposed rule, NMFS considered seven alternative approaches, described in more detail below. NMFS concludes that at the present time there are no legally viable alternative rules that would have less impact on small entities and still fulfill the agency's obligations to protect listed salmonids. The first four alternatives may result in unnecessary impacts on economic activity of small entities, given NMFS' judgment that a more limited application of those protections would suffice to conserve the species.

If you believe the alternative proposed in this rule will impact your economic activity, please comment on whether there is a preferable alternative (including alternatives not described here)

that would meet the statutory requirements of ESA §4(d). Please describe the impact that alternative would have on your economic activity and why the alternative is preferable.

II. Specific Requirement to Prepare an IRFA

The level of detail and sophistication of the analysis should reflect the significance of the impact on small entities. Under 5 U.S.C., §603(b) of the RFA, each IRFA is required to address:

1. A description of the reasons why action by the agency is being considered;
2. A succinct statement of the objectives of, and the legal basis for, the proposed rule;
3. A description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply (including a profile of the industry divided into industry segments, if appropriate);
4. A description of the projected reporting, record keeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the type of professional skills necessary for preparation of the report or record;
5. An identification, to the extent practicable, of all relevant Federal rules that may duplicate, overlap or conflict with the proposed rule;
6. A description of any significant alternatives to the proposed rule that accomplish the stated objectives any other applicable statutes and that would minimize any significant economic impact of the proposed rule on small entities.

III. Reasons For Considering The Proposed Action

Given the threatened biological status of these seven ESUs of threatened salmonids, NMFS finds that the prohibitions for endangered species are generally necessary and advisable for conservation of the species. Therefore NMFS proposes 4(d) rules that would impose the take prohibitions on activities generally, but would not apply those prohibitions to activities found to be adequately protective of the threatened salmonids or otherwise contributing to conservation of the ESUs. The rules do not require any specific actions by non-Federal agencies, businesses, organizations, or private individuals. Rather, they will impose on entities the responsibility to review their actions and modify or eliminate those actions that otherwise would lead to "take" of threatened species.

Prohibitions on "take" of individuals apply to a multitude of activities that may injure or kill listed salmon including harvest, hatchery-related actions, or disturbance of habitat. Harm to salmonids can occur through destruction or modification of habitat (whether or not designated as critical) that significantly impairs essential behaviors, including breeding, feeding, rearing, or migration. The take prohibitions apply only to naturally spawned salmonids and their progeny, and specified hatchery populations that have been included in the listings.

Whether take prohibitions or other protective regulations are necessary or advisable is in large part dependent upon the biological status of the species and potential impacts of various activities on

the species. The NMFS has concluded that threatened salmonids are at risk of extinction primarily because their populations have been reduced by a variety of human activities. West Coast salmonid populations have been depleted by both the obvious type of take involved in harvest, as well as take resulting from past and ongoing destruction of their freshwater and estuarine habitats and from past hatchery practices. Therefore it is necessary and advisable in most circumstances to prohibit take of these threatened ESUs, in order to provide for their conservation.

Although state, local and other programs may not be specifically for the conservation of threatened salmonids, many are being modified to provide greater protection to listed salmonids. NMFS concludes that where a program provides sufficient conservation for listed salmonids, it is neither necessary nor advisable to apply take prohibitions to activities governed by those programs. In those circumstances, additional Federal ESA regulation through the take prohibitions is unnecessary because it will not enhance the conservation of the listed ESUs. NMFS also finds that Federal regulation in such circumstances is not the most beneficial use of limited government resources, which are better spent on enforcement where non-Federal conservation measures have not been undertaken.

IV. Objectives and Legal Basis of Proposed Rule

The purpose of the ESA is to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species...." Under the ESA, a 'threatened' species is one that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. To conserve a species is to use all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to the ESA are no longer necessary. When a species is listed, §7 of the ESA requires Federal agencies to insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat. Section 7 extends protection only against actions that have some nexus to federal agency action, funding, or permitting.

When a species is listed as endangered, §9 of the ESA makes it illegal for any person subject to the jurisdiction of the United States to "take" any wildlife species listed as endangered. For the purposes of this law, "take" of a species means to harass, harm, pursue, hunt, shoot, wound, kill, trap, or collect (or to attempt any of these), import or export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. These §9(a) protections apply by statute only to endangered species, however.

When a species is listed as threatened, §4(d)[5] of the ESA provides that the Secretary shall issue such regulations as he deems necessary and advisable to provide for the conservation of the species, including any or all of the prohibitions applicable to endangered species under §9(a). The purpose of this rule is to provide all necessary and advisable protection for threatened salmonid ESUs, by imposing the take prohibitions. As noted above, there are some programs or categories of activities that contribute to conserving listed salmonids or are governed in a manner that limits impacts on listed salmonids to an extent that makes additional protection through federal regulation unnecessary, and for those activities, NMFS is not imposing the take prohibitions.

This 4(d) rule does not require any specific actions by non-Federal agencies, businesses, organizations, or private individuals. Rather it is the responsibility of individuals, businesses, agencies, and organizations not to "take" endangered or threatened species, once the take prohibitions are in place. NMFS provides guidance and other support to help state and local agencies develop incentive, regulatory, and enforcement programs that effectively promote restoration of the listed population.

V. Analytical Approach and Information Needs

To aid the reader or commenter in understanding the environmental baseline for considering incremental impacts of the rule, NMFS outlines below questions that bear on an assessment of regulations under the Regulatory Flexibility Act.

1. What are the regulations?
2. What constitutes the universe of entities that need to be in compliance with these regulations?
3. What part of this universe is already in compliance, e.g., activities occurring on federal lands, subject to §7 consultations, or governed by existing laws and regulations such as the Clean Water Act?
4. Remaining entities are the ones likely to be impacted by the salmonid regulations.
5. What activities are these impacted entities likely to curtail, modify, or undertake to be in compliance with these regulations?
6. How many of these entities are small entities?
7. Are there Federal, state, or local programs that may help mitigate these financial impacts?

The proposed rule is likely to have direct impacts on substantial numbers of entities. However, what is unknown is the ability of these entities to adapt by changing the manner in which they operate or in changing their mix of products. The following examples are provided to indicate how the proposed rule may affect some of the various sectors and to aid public comment. NMFS asks that in commenting on the proposed rule, entities identify any alternative protective regulation that would meet NMFS' statutory responsibilities but have less impact on their economic activity,

[5] 16 U.S.C. § 1533(d) (1994)

describe the impact that alternative would have on your economic activity, and describe why the alternative is preferable.

Agriculture: What would this rule mean for a farm producing common crops in some of these ESUs, such as fruits, vegetables, and nursery stock? Consider a farm growing 15 acres of raspberries yielding 5,200 pounds per acre with prices for raspberries at $0.72 per pound. Reductions in income could result from reduced use of pesticides which could affect both yield per acre and quality of product (price); changes in the quantity of and timing of irrigation water, or reductions in acres that could be cropped. Are there farming techniques or alternative crops that the farmer could employ to mitigate against any loss of revenue and production?

Forestry: Concern in the forest sector surrounds the riparian buffers that may need protection in order to preserve habitat. (Some of this loss occurs as a result of the listing of the salmonids and not as a result of the 4(d) rule because it occurs on Federal land, or as a result of voluntary forest management habitat preservation measures). Reductions of logging between streams could render the entire area between streams infeasible for logging due to the cost of installing yarding systems for log extraction. How many forest landowners face this type of cost? Do they have alternative uses for the land?

Commercial Fishing: For commercial fishing , NMFS does not anticipate any effects on the commercial fishing industry resulting from the 4(d) rule, though certain practices may require modification.

Small Governments: Small governmental jurisdictions are defined as any government of a district with a population of less than 50,000. Districts may include those servicing irrigation, ports, parks and recreation, sanitation, drainage, soil and water conservation, road assessment, etc. These governmental jurisdictions may be affected in many ways including: additional planning required to modify existing programs, increased construction costs in road building and drainage system construction, losses of recreational revenue in the forms of park entry fees and licensing, increased water management costs, increased need for public education, and increased monitoring and enforcement costs. Water management districts are especially susceptible to impacts because flow alterations may be necessary to aid both spawning and smolt migration. How will this propose rule affect the allocations of water and existing plans? Will new programs for conservation and protection have to undertaken?

VI. Effects of the 4(d) Regulation– Prohibitions and Limitations

Take Prohibitions

Individuals or entities conducting activities that could potentially harm, injure, or kill listed salmonids and result in violations of this rule should evaluate the likelihood that their particular activity will do so either directly or through alteration of habitat. They may need to alter the

activity, obtain an incidental take permit, or otherwise avoid any unauthorized take of listed fish. Some of the activities NMFS believes could "take" listed fish include, but are not limited to:

1. Land-use activities that adversely affect salmonid habitat (e.g., logging, grazing, farming, or road construction particularly when conducted in riparian areas, or in areas susceptible to mass wasting and surface erosion);
2. Destruction or alteration of salmonid habitat (aside from habitat restoration activities), such as removal of large woody debris and "sinker logs" or riparian shade canopy, dredging, discharge of fill material, draining, ditching, diverting, blocking, or altering stream channels or surface or ground water flow;
3. Discharges or dumping of toxic chemicals or other pollutants (e.g., sewage, oil, gasoline) into waters or riparian areas supporting the listed salmonids;
4. Violation of discharge permits;
5. Pesticide applications in violation of Federal restrictions;
6. Interstate and foreign commerce of listed salmonids and import/export of listed salmonids without an ESA permit, unless the fish were harvested pursuant to this rule;
7. Except as provided in the rule, collecting, or handling listed salmonids;
8. Introduction of non-native species likely to prey on listed salmonids or displace them from their habitat;
9. Water withdrawals in areas where important spawning or rearing habitats may be adversely affected, or otherwise altering streamflow when it is likely to impair spawning, migration, or other essential functions;
10. Constructing or maintaining barriers that eliminate or impede a listed species' access to habitat essential for its survival or recovery;
11. Removing, poisoning, or contaminating plants, fish, wildlife, or other biota required by the listed species for feeding, sheltering, or other essential functions;
12. Releasing non-indigenous or artificially propagated individuals into a listed species' habitat;
13. Constructing or operating inadequate fish screens or fish passage facilities at dams or water diversion structures in a listed species habitat;
14. Constructing or using inadequate bridges, roads, or trails on stream banks or unstable hill slopes adjacent or above a listed species' habitat; or
15. Constructing or using inadequate pipes, tanks, or storage devices containing toxic substances, where the release of such a substance is likely to significantly modify or degrade listed species' habitat.

Limits on the Take Prohibitions

As a matter of law, impacts on listed salmonids due to actions in compliance with a permit issued by NMFS pursuant to §10 of the ESA are not violations of this rule. Section 10 permits may be issued for research activities, enhancement of the species' survival, or to authorize incidental take occurring in the course of an otherwise lawful activity. Likewise federally funded or approved activities for which §7 consultations have been completed, and which are conducted in accord with all reasonable and prudent measures, terms, and conditions provided by NMFS in a biological opinion and accompanying incidental take statement pursuant to §7 of the ESA will not constitute violations of this rule. NMFS consults on a broad range of activities conducted, funded or

authorized by Federal agencies, including fisheries harvest, hatchery operations, silviculture, grazing, mining, road construction, dam construction and operation, discharge of fill material, stream channelization or diversion.

NMFS has determined that it is neither necessary nor advisable to impose §9 take prohibitions on certain programs or activities carried out or authorized by state or other governments in the threatened salmonid ESUs, where those activities contribute to conservation of the ESU or are regulated by other entities in a way that is adequately protective of salmonids.

1. Fishery Management Limits on the Take Prohibitions
NMFS believes that fisheries for non-listed salmonids can have an acceptably limited effect on listed salmonids, as long as state fishery management programs are specifically tailored to protect listed salmonids. Through the proposed rule, NMFS proposes not to impose take prohibitions where states have adequate programs. To qualify for this limit on the take prohibitions a state must have developed a Fishery Management and Evaluation Plan (FMEP) for their respective salmonid and resident species fisheries that adequately limits take of listed salmonids and have entered into a Memorandum of Agreement (MOA) with NMFS to ensure adequate implementation of the FMEP.

NMFS also concludes that carefully designed artificial propagation programs may be consistent with and support protection and conservation of listed salmonids. If a state or federal agency develops a Hatchery and Genetic Management Plan containing specific management measures that adequately limits take of listed salmonids and promote the conservation of the listed ESU, NMFS finds that additional Federal protections through imposition of take prohibitions would be unnecessary for conservation of the listed salmonids.

2. Scientific Research Limits on the Take Prohibitions
In carrying out their fishery management responsibilities in Washington and Oregon, state fishery management agencies conduct or permit a wide range of scientific research activities on various fisheries, including studies on salmonids occur in the seven listed ESUs. NMFS finds these activities are vital for improving an understanding of the status and risks facing salmonids and other species in these ESUs, and will provide critical information for assessing effectiveness of current and future management practices. Therefore the take prohibitions are not imposed on these activities so long as conducted with approval of the respective state in accord with limitations and reporting requirements of the rule.

3. Habitat Restoration Limits on the Take Prohibitions
Certain habitat restoration activities are likely to contribute to conserving salmonids, and NMFS therefore does not propose to impose take prohibitions on such activities so long as they are conducted in accordance with appropriate standards and guidelines. Projects planned and carried out based on at least a watershed-scale analysis and conservation plan, and, where practicable, a sub-basin or basin-scale analysis and plan, are likely to be the most beneficial. The rule therefore provides that §9(a) take prohibitions will not apply to habitat restoration activities found to be part of, and conducted pursuant to a watershed conservation plan. A state must approve or disapprove

watershed conservation plans depending on whether they are formulated in accordance with NMFS-approved state watershed conservation plan guidelines.

This rule also proposes that until approved watershed plans are in place, take prohibitions would not be applied to several habitat restoration activities if carried out in accord with applicable state guidance, and of course with any required reviews or permits. The activities excepted under carefully defined conditions are:

a. Riparian zone planting or fencing
b. Livestock water development off-channel
c. Large wood or boulder placement
d. Correcting road/stream crossings, including culverts, to allow or improve fish passage.
e. Repair, maintenance, or decommissioning of roads in danger of failure.
f. Salmonid carcass placement.

More complex restoration activities such as habitat construction projects or channel alterations require project by project technical review at least until watershed planning is complete. The purpose of this limit on application of the take prohibitions is to enable beneficial habitat restoration activities to continue in the short term until states formulate more comprehensive watershed conservation plan guidelines and plans. After a watershed conservation plan has been approved, only activities conducted pursuant to the plan will be within the limit on take prohibitions. If no plan has been approved for a watershed within two years following the effective date of this interim rule, the general §9(a) take prohibitions of this interim §4(d) rule apply to individual restoration activities just as to all other habitat-affecting activities.

4. Limit on the Take Prohibitions for Properly Screened Water Diversions

A widely recognized cause of mortality among anadromous fish is operation of water diversions without adequate screening. Juveniles may be sucked or attracted into diversion ditches where they later die from a variety of causes, including stranding. Adult and juvenile migration may be impaired by diversion structures, including push-up dams. Juveniles are often injured and killed through entrainment in pumping facilities or impingement on inadequate screens, where water pressure and mechanical forces are often lethal. Despite long-time recognition of these problems and a multitude of state and Federal approaches to reducing these impacts, large numbers of diversions are not adequately screened and remain a threat, particularly to juvenile salmonids. This rule proposes to recognize those diverters who have provided adequate screening, and encourage others to take that step, by not applying the take prohibitions for those diversions that are properly screened in accord with NMFS' fish screening criteria. The proposed limit on the take prohibitions applies only to physical impacts on listed fish due to entrainment or similar impacts of the act of diverting. It does not include take that may be caused by instream flow reductions associated with operation of the water diversion facility, nor impacts associated with installation of the stream (dewatering, etc.).

5. Routine Road Maintenance Limit on the Take Prohibitions

The Oregon Department of Transportation (ODOT) is responsible for the extensive existing transportation infrastructure represented by Oregon's state highway system. ODOT maintenance

and environmental staff have developed a program that greatly improves protections for listed salmonids with respect to the range of routine maintenance activities, minimizing their impacts on receiving streams. ODOT's program includes its Maintenance of Water Quality and Habitat Guide dated June, 1999 (Guide) and a number of supporting policies and practices. NMFS does not find in necessary or advisable to apply take prohibitions to routine road maintenance work performed consistent with the Guide, because in NMFS' judgement doing so would not increase the level of protection provided for listed salmonids. Activities other than routine maintenance, including new construction, major replacements, or activity for which a Corps of Engineers permit is required, will remain subject to the take prohibitions. Likewise, take prohibitions do apply to any pesticide applications or dust abatement applications associated with road maintenance. Any Oregon city or county desiring that take prohibitions not apply to its routine road maintenance activities must not only commit in writing to apply the measures in the Guide, but also must first enter a memorandum of agreement with NMFS detailing how it will assure adequate training, tracking, and reporting.

6. Portland Parks Integrated Pest Management Limit on the Take Prohibitions
The City of Portland, Oregon, Parks and Recreation (PP&R) operates a diverse system of city parks representing a full spectrum from intensively managed recreation, sport, golf, or garden sites to largely natural, unmanaged parks, including the an extensive, wooded Forest Park. PP&R has been operating and refining an integrated pest management program for 10 years, with a goal of reducing the extent of its use of herbicides and pesticides in park maintenance. As a result of this program, the City has phased out regularly scheduled treatments such as turf spraying to control broadleaf weeds. This has reduced total use of chemical to control broadleaf weeds to less than 15% of its former level. The program's "decision tree" place first priority on prevention of pest (weeds, insects, disease) through policy, planning, and avoidance measures (design and plant selection). Second priority is on cultural and mechanical practices, trapping, and biological controls. Use of biological products, and finally of chemical products, is to be considered last. PP&R's overall program affects only a small proportion of the land base and waterways within Portland, and serves to minimize any impacts on listed salmonids from chemical applications associated with that specific, limited land base.

The PP&R has recently developed special policies to provide extra protections near waterways and wetlands, including a 25 foot buffer zone in which pesticide use is limited to specified products, applied with a hand wand from a backpack sprayer, which utilizes low pressure spray to minimize drift NMFS concludes that PP&R's program provides adequate protection for listed salmonids with respect to the limited chemical use the program entails. NMFS does not find in necessary or advisable to apply additional Federal protections in the form of take prohibitions to PP&R activities conducted under PP&R's integrated pest management program, because doing so would not increase the level of protection provided for listed salmonids. NMFS therefore does not propose to apply the take prohibitions of this rule to activities within the PP&R program.

7. Limit on the Take Prohibitions for New Urban Density Development
As a general matter, significant new urban scale developments have the potential to degrade salmonid habitat and to injure or kill salmonids through a variety of impacts. Through this

proposed rule, NMFS proposes a mechanism whereby jurisdictions can be assured that development authorized within those areas is consistent with ESA requirements and avoids or minimizes the risk of take of listed salmonids.

This rule proposes that NMFS will not apply take prohibitions to new developments governed by and conducted in accord with adequate city ordinances that help conserve anadromous salmonids. Similarly, take prohibitions will not be applied to development consistent with an Urban Reserve Plan that Portland's metropolitan regional government, Metro, has evaluated and approved as in compliance with adequate guidelines. In evaluating adequacy of Metro guidelines or local ordinances NMFS will focus on twelve issues:

a. Siting that avoids sensitive or constrained sites.
b. Avoiding stormwater discharge impacts to water quality and quantity, and to the historic hydrograph characteristics of the watershed.
c. Protection of adequate vegetated riparian buffers along all streams.
d. Avoiding stream crossings by roads wherever possible, and minimizing their impacts.
e. Protecting historic stream meander patterns, flood plains and channel migration zones.
f. Protecting wetlands and surrounding vegetation to maintain wetland functions.
g. Preserving the hydrologic capacity of streams to pass peak flows.
h. Landscaping to reduce need for watering and chemical application.
i. Preventing erosion and sediment run-off during and after construction.
j. Assuring that water supply demands do not impact flows needed for salmonids.
k. Monitoring and maintaining detention basins and similar tools.
l. Providing needed enforcement, funding, monitoring, reporting, and implementation mechanisms.

8. Limit on the Take Prohibitions for Forest Management in Washington
In the State of Washington, discussions among timber industry, tribes, state and federal agencies, and interest groups have led to an April 29, 1999 Forests and Fish Report (FFR) to Governor Locke which provides important improvements in forest practice regulation. It also mandates that all existing forest roads be inventoried for potential impacts on salmonids through culvert inadequacies, erosion, slope failures, and the like, and all needed improvements be completed within 15 years. Because of the substantial detrimental impacts of inadequately sited, constructed or maintained forest roads on salmonid habitat, this feature of the overall FFR provides a significant conservation benefit for listed ESUs in Washington.

Because of the above features NMFS does not propose to apply §9 take prohibitions to non-Federal forest management activity conducted in the State of Washington in compliance with the FFR and forest practice regulations implemented by the Washington Forest Practices Board that are at least as protective of habitat functions as are the regulatory elements of the FFR. These measures will provide a significant level of protection to listed salmonids and contribute to their conservation. Activity associated with pesticide use or undertaken pursuant to alternate plans is not within this limitation and would remain subject to take prohibitions.

Elements of the FFR that provide protections or conservation benefits for salmonids include:

a. Adequate classification of water bodies and broad availability of that information.
b. Maintenance and upgrade of existing as well as new forest roads.
c. Protection for unstable slopes from increased failure and sedimentation to streams.
d. Measures to achieve properly functioning riparian conditions.
e. Adequate monitoring and adaptive management programs.

VII. Number and Description of Affected Small Entities

Based on the expected effects of the 4(d) rule, the following series of subsections enumerate, to the extent practicable, the number and nature of the "small entities" which comprise the commercial sectors, not-for-profit organizations, and governmental jurisdictions and communities that are likely to be affected by this proposed rule. Taken as a whole, these "entities" define the potentially impacted universe for purposes of the IRFA.

The Small Business Administration (SBA), under the Small Business Size Standards, defines whether a business entity is eligible for government programs and preferences reserved for "small business" concerns. Size standards have been established for types of economic activity or industry generally within the Standard Industrial Classification (SIC) System. Rough guidelines are that a small company employs fewer than 500 people and has less than $5,000,000 in annual sales. For purposes of this analysis, since sales information by firm size is not available, small business will be defined to be ones that employ fewer than 500 people. (SBA has undertaken a national analysis of firms that indicates that typically for a given industry or SIC category, ninety percent of firms employ less than 20 people.) Small government entities are defined as those serving populations of 50,000 or less. In some instances this may be an entire county government, or all political subdivisions and public districts within such counties. Most tribal governments will also meet this standard. Identification of "small organizations" is defined as "any nonprofit enterprise that is independently owned and operated and not dominant in its field." These may include irrigation districts, public utilities, agricultural co-ops, etc.

Sectors

1. Agriculture: Agriculture includes both crop and livestock farming and ranching. Some soil disturbing activities are involved in all types of agriculture. Chemicals (fertilizers and pesticides) are used on cultivated crops and pastures. Some cropland and pasture is irrigated. Use of riparian areas for livestock grazing and some crop production also occurs. Some livestock activities result in concentrated accumulation of animal wastes. All of these activities could potentially be modified or curtailed by farmers and ranchers to avoid "taking" of salmonids. Tillage practices may be modified to minimize soil-disturbing activities. Use of chemicals, such as fertilizers and pesticides, could be modified. Irrigated acreage could be reduced in response to instream flow needs designed to protect habitat. Use of riparian areas for livestock grazing and some crop production could be curtailed. Management of animal wastes could be modified. Management of noxious plants may become more costly. All of these activities could potentially be modified or curtailed in response to the rule, affecting both the costs of production and yield rates, resulting in a

change in net farm income. It is likely that some modification or curtailment in agricultural activities will occur as a result of application of take prohibitions.

2. Forestry: Forest management activities typically include site preparation, planting, release, pre-commercial thinning, fertilizing, commercial thinning, and final harvest, with this cycle repeated for each rotation. Within this cycle, there are a number of activities where the common methods used may have to be modified in response to the rule. Several of the activities may involve either construction or re-construction of roads. It is also possible that some harvest methods may have to be modified to lessen the potential amount of soil disturbance. Use of chemicals may also be curtailed, resulting in release activities being modified to use more hand methods instead of chemical methods, and there may be limits on fertilization. In addition to modification of these activities, there may be limits on the land areas where they may be practiced, such as buffer areas around streams. It is likely that some modification or curtailment in forestry activities will occur as a result of the imposition of take prohibitions. Indirect effects from forest products manufacturing activities may result from those changes.

3. Fishing: Washington and Oregon are developing Fishery Management and Evaluation Plans that are expected to adequately limit incidental take of listed salmon. Thus, in those states the take prohibitions will likely not apply to ongoing fisheries for non-listed salmon and resident species. Of course, fisheries in the Columbia River and Pacific Ocean are governed by Federal plans subject to ESA § 7 consultation.

4. Mining: The most common form of mining potentially affected by the 4(d) rule is sand and gravel. Removal of material from streams may occur in the usual course of this activity, and mining gravel may also result in the production of sediment. Some metal mining also occurs in the various ESUs. Mine wastes may produce both sediments and chemicals. Placer mining and "mini-dredges" present the possibility of streambed disturbance. All of these activities could potentially be modified or curtailed to avoid any substantial risk of "taking" listed salmonids.

5. Construction: Residential development, commercial development, and highway construction may all involve soil-disturbing activities that can produce sediment in runoff. Where salmonid habitat interacts with growth centers, construction activities could potentially be modified or curtailed in response to the prohibitions on take.

Identification of Small Businesses within Threatened Salmonid ESU Impact Areas

The Small Business Administration (SBA), under the Small Business Size Standards, defines whether a business entity is eligible for government programs and preferences reserved for "small business" concerns. Size standards have been established for types of economic activity or industry generally within the Standard Industrial Classification (SIC) System. The SIC system assigns four-digit SIC codes to all economic activity within ten major divisions. A full table matching a size standard with each four-digit SIC code is published annually by SBA in the Federal Register. Table 1 shows the SIC codes and the sectors used in this analysis to determine the number of small establishments.

Table 1
Small Establishments Sectors

SIC	Sector Description
0700	Agricultural Services
0800	Forestry
0900	Fishing
1000	Metal Mining
1400	Non Metallic Mining
1440	Sand & Gravel
1600	Heavy Construction
1610	Highway & Street Construction
2091	Canned & Cured Seafood
2092	Fresh & Frozen Fish
2410	Logging
2420	Sawmills & Planing Mills
2436	Softwood Plywood & Veneer
2610	Pulp Mills
4449	Water Transportation, Freight NEC
4910	Electric Services

Identification and Description of Small Governments within ESU Impact Area

Small government entities are defined as those serving populations of 50,000 or less. In some instances this may be an entire county government, or all political subdivisions and public districts within such counties. Districts may include those servicing irrigation, ports, parks and recreation, sanitation, drainage, soil and water conservation, road assessment, etc. These governmental jurisdictions may be affected in many ways including: additional planning required to modify existing programs, increased construction costs in road building and drainage system construction, losses of recreational revenue in the forms of park entry fees and licensing, increased water management costs, increased need for public education, and increased monitoring and enforcement costs. Water management districts are especially susceptible to impacts because flow alterations may be necessary to aid both spawning and smolt migration. This may result in reallocations of water, redesigning existing plans, and developing new programs for conservation and protective measures. These small entities are a likely form of small entity to experience significant impacts. Most tribal governments will also meet this standard. When counties have populations greater than 50,000, those municipalities of fewer than 50,000 can be identified using population reports. Other

types of small government entities are not as easily identified under this standard, as they are not typically classified by population.

1. Columbia River (CR) Chum ESU: Included in this ESU are seven county governments and all of the city governments in these counties, as well as suburban cities within the larger counties, and several types of district governments.
2. Hood Canal Summer (HCS) Chum ESU: Included in this ESU are two county governments and all of the city governments in these counties, as well as suburban cities within the larger counties, and several types of district governments.
3. Lower Columbia River (LCR) Chinook ESU: Included in this ESU are five county governments and all of the city governments in these counties, as well as suburban cities within the larger counties and several types of district governments.
4. Oregon Coast (OC) Coho ESU: Included in this ESU are five county governments and all of the city governments in these counties, as well as suburban cities within the larger counties, and several types of district governments. Five Indian tribes are also located within the ESU.
5. Ozette Lake (OZ) Sockeye ESU: While Clallam County has a population in excess of 50,000, all of the city governments within the county serve populations of less than 50,000, and there are several types of district governments. The Ozette Indian Reservation is also located within the ESU.
6. Puget Sound (PS) Chinook ESU: Included in this ESU are three county governments and all of the city governments in these counties, as well as suburban cities within the larger counties and several types of district governments.
7. Upper Willamette River (UWR) Chinook ESU: There are five cities in the ESU with populations of 50,000 or more. All other cities are categorized as small entities. Also, the Grand Ronde Indian Reservation is in the ESU impact area..

Identification of Small Organizations within ESU Impact Area

Small organizations are more difficult to categorize. No quantifiable standard, such as number of employees, business receipts, or population is generally available. Identification of "small organizations" is defined as "any nonprofit enterprise that is independently owned and operated and not dominant in its field." These may include irrigation districts, public utilities, agricultural co-ops, etc. Further, depending upon state laws, it may be difficult to distinguish whether a small entity is a government or nonprofit entity. For example, a water supply entity may be a cooperative owned by its members in one case and in another a publicly chartered small government with the assets owned publicly and officers elected at the same elections as other public officials. NMFS encourages comment from any small organization that believes the rule may impact its activities.

Geographic Boundaries for Economic Unit Corresponding to ESU

Counties included in this analysis area were identified using data provided by NMFS on county land area included in the ESU and maps provided by NMFS identifying the boundary of the ESU. If any portion of a county was inside the ESU boundary, the entire county was included in the economic impact area. This approach was used because business activities are not restricted by geographic boundaries. Businesses such as those within the agricultural service sector may work within the ESU, and therefore be affected by the 4(d) rule, though they are physically located

outside the ESU. Also, changes in water use for an entity within the ESU could impact small entities outside the ESU through changes in availability of water. In practice, the majority of water use planning and management programs are in place already (see VIII. Baseline of Existing Protective Measures), and these have some level of provisions to protect threatened or endangered fish. Counties not inside the ESU boundary, but adjacent to counties within the ESU, were evaluated to determine if there could be possible spillover effects on small entities within those counties.

1. Columbia River (CR) Chum ESU: This ESU includes all naturally spawned chum salmon in the Columbia River downstream from Bonneville Dam, excluding Oregon tributaries upstream of Milton Creek at river km 144 near the town of St. Helens. The following counties are included in the Columbia River ESU impact area: Clackamas, Clatsop, Columbia, Multnomah, and Hood River, Oregon; Clark, Cowlitz, Skamania, Klickitat, Lewis, Wahkiakum, and Pacific, Washington. For the Columbia River ESU, 9 percent of the land is Federally-owned. Because Federal land management agencies must comply with species protection measures as a result of a species being listed as threatened or endangered, this land will not be affected by the 4(d) rule. However, 80 percent of the land in this ESU is privately owned, and the remainder is state, local or tribal. Hence the majority of this land will be affected by the 4(d) rule.

2. Hood Canal Summer (HCS) Chum ESU: This ESU includes all naturally spawned chum salmon in the Hood Canal drainage as well as Olympic Peninsula rivers between Hood Canal and Sequim Bay, Washington. Also included is the Hood Canal waterway, from its southern terminus at the Union River, north to its confluence with Admiralty Inlet near Port Ludlow, Washington. The following counties are included in the Hood Canal ESU impact area: Clallam, Jefferson, Kitsap, and Mason, Washington. For the Hood Canal ESU, 48 percent of the land is Federally-owned. Because Federal land management agencies must comply with species protection measures as a result of a species being listed as threatened or endangered, this land will not be affected by the 4(d) rule. However, 39 percent of the land in this ESU is privately owned, and the remainder is state, local or tribal. Hence approximately half of the land area in this ESU will be affected by the 4(d) rule.

3. Lower Columbia River (LCR) Chinook ESU: This ESU includes all naturally spawned chinook populations residing below impassable natural barriers (e.g., long-standing, natural waterfalls) from the mouth of the Columbia River to the crest of the Cascade Range just east of the Hood River in Oregon and the White Salmon River in Washington. NMFS concludes that none of the hatchery chinook salmon stocks identified as part of this ESU should be listed since none are currently essential for the recovery of the ESU. The following counties are included in the Lower Columbia River ESU impact area: Clackamas, Clatsop, Columbia, Multnomah, and Hood River, Oregon; Clark, Cowlitz, Skamania, Lewis, Wahkiakum, and Pacific, Washington. For the Lower Columbia River ESU, 36 percent of the land is Federally-owned. Because Federal land management agencies must comply with species protection measures as a result of a species being listed as threatened or endangered, this land will not be affected by the 4(d) rule. However, 56 percent of the land in this ESU is privately owned, and the remainder is state, local or tribal. Hence the majority of this land will be affected by the 4(d) rule.

4. Upper Willamette River (UWR) Chinook ESU: Chinook habitat in the Upper Willamette River ESU is designated to include all river reaches accessible to chinook salmon in the Willamette River and its tributaries above Willamette Falls. This ESU includes naturally spawned spring-run populations above Willamette Falls. Major rivers known to support chinook salmon within the upper Willamette River ESU include the Mollala River, North Santiam River, and McKenzie River. Fall chinook salmon above the Willamette Falls are introduced and although they are naturally spawning, they are not considered a population for purposes of defining this ESU. NMFS concludes that none of the hatchery chinook salmon stocks identified as part of this ESU should be listed since none are currently essential for the recovery of the ESU. The following counties are included in the Upper Willamette River Chinook Salmon ESU impact area: Washington, Clackamas, Marion, Linn, Benton, Polk, Yamhill, and Lane, Oregon. For the Upper Willamette River ESU, 23 percent of the land is Federally-owned. Because Federal land management agencies must comply with species protection measures as a result of a species being listed as threatened or endangered, this land will not be affected by the 4(d) rule. However, 75 percent of the land in this ESU is privately owned, and the remainder is state, local or tribal. Hence the majority of this land will be affected by the 4(d) rule.

5. Oregon Coast (OC) Coho ESU: Coho included in the Oregon Coast ESU are all naturally spawned populations of coho salmon in Oregon coastal streams south of the Columbia River and north of Cape Blanco. Excluded are areas above specific dams or above longstanding, naturally impassable barriers (i.e., natural waterfalls in existence for at least several hundred years). The following counties are included in the Oregon Coast ESU impact area: Clatsop, Tillamook, Columbia, Yamhill, Lincoln, Polk, Benton, Lane, Douglas, Coos, and Curry, Oregon. For the Oregon Coast ESU, 35 percent of the land is Federally-owned. Because Federal land management agencies must comply with species protection measures as a result of a species being listed as threatened or endangered, this land will not be affected by the 4(d) rule. However, 56 percent of the land in this ESU is privately owned, and the remainder is state, local or tribal. Hence the majority of this land will be affected by the 4(d) rule.

6. Ozette Lake (OZ) Sockeye ESU: This ESU includes all naturally spawned sockeye residing below impassable natural barriers (e.g., long-standing, natural waterfalls) in the Ozette Lake Basin. The following county is included in the Ozette Lake ESU impact area: Clallam, Washington. For the Ozette Lake ESU, 15 percent of the land is Federally-owned. Because Federal land management agencies must comply with species protection measures as a result of a species being listed as threatened or endangered, this land will not be affected by the 4(d) rule. However, 75 percent of the land in this ESU is privately owned, and the remainder is state, local or tribal. Hence the majority of this land will be affected by the 4(d) rule.

7. Puget Sound (PS) Chinook ESU: This ESU includes all naturally spawned chinook populations residing below impassable natural barriers (e.g., long-standing, natural waterfalls) in the Puget Sound region from the North Fork Nooksack River to the Elwha River on the Olympic Peninsula, inclusive. The following counties are included in the Puget Sound ESU impact area: Whatcom, Skagit, Snohomish, King, Pierce, Thurston, Mason, Jefferson, Clallam, Kitsap, Island, and San Juan, Washington. For the Puget Sound ESU, 36 percent of the land is Federally-owned.

Because Federal land management agencies must comply with species protection measures as a result of a species being listed as threatened or endangered, this land will not be affected by the 4(d) rule. However, 53 percent of the land in this ESU is privately owned, and the remainder is state, local or tribal. Hence the majority of this land will be affected by the 4(d) rule.

Universe--Numbers of Small Businesses

County Business Patterns (CBP) data, published by the U.S. Department of Commerce, are used at the county level to determine the number of firms in each affected sector in each county that meet the SBA small business classification standard. The results of the identification of small entities in counties associated with the various ESUs are presented in Tables 2 and 3. These tables establish an upper limit on the number of small businesses potentially affected by the 4(d) rule. Some of these establishments are a part of a larger entity that does not fit the criteria for a small business. Furthermore, as illustrated by the list of questions in Section V that establish the baseline for which impacts are to be measured., not all of these establishments will be impacted by these salmonid regulations given the presence of other regulations and the limits on take prohibitions set out in the rule.

For the sectors examined, almost all establishments had between 1 and 499 employees. The few exceptions were the following. On a ESU basis, Electric Services categories contained large establishments in CR (2 large); LCR (2), OZ (1), and PS (1). Large establishments were also contained in Softwood, Plywood, and Veneer-OC (3); Heavy Construction-OZ (4) and PS (4), and Sawmills and Planing Mills-UW (1). The Census of Agriculture was used to identify the number of farms with sales of less than $500,000. Except for the LCR (88 percent) and the PS (95 percent) ESUs, the percentage of farms that had sales below the SBA threshold of less than $500,000 in sales was typically 97 percent or higher (see Table 3).

Table 2-Number of Establishments by ESU

Type of Establishment	CR	HCS	LCR	OC	OZ	PS	UW
Agricultural Services	685	169	680	386	31	1,948	859
Forestry	103	31	100	163	10	105	171
Fishing	50	38	50	75	9	377	10
Metal Mining	1	0	1	3	0	6	6
Non-Metallic Mining	42	16	40	46	6	75	61
Sand & Gravel Mining	20	8	18	19	4	36	28
Heavy Construction	311	63	304	172	22	639	283
Highway & Street Construction	103	15	99	82	5	140	101
Logging	460	126	410	689	77	423	464
Sawmills & Planing Mills	92	39	92	107	26	150	98
Softwood Plywood & Veneer	10	2	9	28	1	10	22
Electric Services	39	12	37	36	1	73	29

Table 3-Number of Farms by ESU

ESU	Less than $500,000	$500,000 or More
Columbia River Chum ESU	8,653	176
Hood Canal Summer Chum ESU	949	6
LColumbia River Chum ESU	8,157	164
Oregon Coast Coho ESU	9,387	195
Ozette Lake Sockeye ESU	325	3
PS ESU	7,490	365
UW ESU	14,124	445

VIII. Baseline of Existing Protective Measures

This analysis addresses the incremental economic impacts of the rule on small entities, over and above the baseline conditions established by listing actions and those activities adequately regulated by state and tribal governments which aid in the conservation of the species.

Existing regulations and programs are reviewed below, in an effort to isolate the incremental actions small entities may need to take to avoid "taking" listed salmon beyond behavior already required by previous listings of endangered species, by various Federal laws such as the Clean Water Act, various state conservation measures, and any other existing fish and wildlife legislation.

Federal Protection Measures

1. Previous Listings

a. Columbia River Chum ESU: Previously, the steelhead has been listed as threatened in the Lower Columbia River ESU.[6] The steelhead ESU significantly overlaps with the Columbia River ESU for chum. Also, on March 24, 1999, NMFS listed the chinook salmon as threatened in the Lower Columbia River ESU.[7] This ESU also significantly overlaps with the Columbia River Basin ESU for chum. Consequently, it is assumed that many actions that benefit chum conservation have already been taken as a result of the previous steelhead listing and will simultaneously be undertaken for purposes of chinook salmon conservation.

b. Hood Canal Summer Chum ESU: One day prior to the final rule listing chum salmon as threatened in the Hood Canal ESU, the chinook salmon was listed as threatened in the Puget Sound ESU.[8] The chinook ESU covers all of the area included within the Hood Canal ESU for summer-run chum. Consequently, it is assumed that many actions that benefit chum conservation will also be taken for the purpose of chinook salmon conservation .

c. Lower Columbia River Chinook ESU: Previously, steelhead have been listed as threatened in the Lower Columbia River ESU.[9] The steelhead ESU significantly overlaps with the Lower Columbia River Basin ESU for chinook. Consequently, it is assumed that many actions that benefit chinook conservation have already been taken as a result of the previous steelhead listing.

d. Oregon Coast Coho ESU: There are no previously listed anadromous fish in the Oregon Coast ESU. However, steelhead is a candidate species for listing in this ESU.

e. Ozette Lake Sockeye ESU: Sixteen days prior to the announcement listing the Ozette Lake sockeye as threatened, NMFS listed the chinook salmon as threatened in the Puget Sound

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[6] 63 FR 13347.

[7] 64 FR 14308.

[8] 64 FR 14308.

[9] 63 FR 13347

ESU.[10] The chinook ESU is much larger and completely encloses the Ozette Lake ESU for sockeye. Consequently, it is assumed that many actions that benefit sockeye conservation in this ESU will also need to be taken as a result of the previous chinook listing.

f. Puget Sound Chinook ESU: No anadromous fish has been previously listed in the Puget Sound chinook ESU.

g. Upper Willamette River Chinook ESU: Previously, the steelhead has been listed as threatened in the Upper Willamette River ESU.[11] The steelhead ESU significantly overlaps with the Upper Willamette River Basin ESU for chinook. Consequently, it is assumed that many actions that benefit chinook conservation will also be undertaken for the purpose of preserving other listed species..

2. Section 7 Consultation

Actions with Federal involvement (i.e., authorized, funded, or conducted by a Federal agency) fall under §7 of the ESA. Section 7 is a very powerful mechanism to avoid activities that jeopardize listed species or affect critical habitat. Under §7, Federal agencies must ensure that their actions are not likely to jeopardize the continued existence of the listed species. Activities that jeopardize a species are defined as those actions that "reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery" of the species (See 50 C.F.R. 402.02). Examples of Federal activities that may affect the conservation of salmonids include dam and hatchery operations, marine fishery regulations, Federal land management activities, and Federal licensing and permitting for such actions as forestry and logging, mining, road construction, dam construction, discharge of fill material, stream channelization, and stream diversion. These activities are not affected by the 4(d) prohibitions, as long as §7 consultation has been completed and such activities are conducted in accordance with any terms and conditions specified by NMFS. Consultations are required automatically after a species is listed. As a result, this economic analysis addresses only the incremental impacts of the proposed 4(d) rule, and excludes the effects on small businesses which may occur at present or in the future as a result of Federal agency policy changes resulting from §7 consultations.

3. Northwest Forest Plan

The Northwest Forest Plan (NFP) is a Federal management policy with important benefits for salmonids. While the NFP covers a very large area, the overall effectiveness of the NFP in conserving salmonids is limited by the extent of Federal lands and the fact that Federal land ownership is not uniformly distributed in watersheds within the affected ESUs. The extent and distribution of Federal lands limits the NFP's ability to achieve its aquatic habitat restoration

[10] 64 FR 14308.

[11] 64 FR 13408.

objectives at watershed and river basin scales and highlights the importance of complementary salmon habitat conservation measures on non-Federal lands within the subject ESUs.[12]

4. PACFISH

On February 25, 1995, the U.S. Forest Service and Bureau of Land Management adopted Implementation of Interim Strategies for Managing Anadromous Fish-Producing Watersheds in eastern Oregon and Washington, Idaho, and portions of California (known as PACFISH). The strategy was developed in response to significant declines in naturally reproducing salmonid stocks, and widespread degradation of anadromous fish habitat throughout public lands in Idaho, Washington, Oregon, and California, outside the range of the northern spotted owl. Like the NFP, PACFISH is an attempt to provide a consistent approach for maintaining and restoring aquatic and riparian habitat conditions which, in turn, are expected to promote the sustained natural production of anadromous fish. However, as with the NFP, PACFISH is limited by the extent of Federal lands and the fact that Federal land ownership is not uniformly distributed in watersheds within the affected ESUs. Furthermore, PACFISH was designed to be a short-term land management/anadromous fish conservation strategy to halt habitat degradation and begin the restoration processes until a long-term strategy could be adopted through the Interior Columbia River Basin Ecosystem Management Project While final work on ICBEMP has been delayed, NMFS has consulted with both USFS and BLM on current forest management activities, in order to assure that they will no jeopardize listed salmonids.

5. Habitat Conservation Plans (HCPs)

NMFS and FWS are also engaged in an ongoing effort to assist in the development of multiple species Habitat Conservation Plans (HCPs) for state and privately owned lands in Oregon and Washington. While §7 of the ESA addresses species protection associated with Federal actions and lands, Habitat Conservation Planning under §10 of the ESA addresses species protection on private (non-Federal) lands. HCPs are particularly important since significant percentages of the habitat in the range of these seven ESUs is in non-Federal ownership. The intent of the HCP process is to ensure that any incidental taking of listed species will not appreciably reduce the likelihood of survival of the species, reduce conflicts between listed species and economic development activities, and to provide a framework that would encourage "creative partnerships" between the public and private sectors and state, municipal, and Federal agencies in the interests of endangered and threatened species and habitat conservation.

6. Clean Water Act (CWA)

The Federal Water Pollution Control Act (FWPCA) was originally enacted in 1972 and amended with major provisions by legislation in 1977, 1981, and 1987. It is commonly referred to as the Clean Water Act, the title of the 1977 amendments. The principle objective of the Act is to restore and maintain the chemical, physical, and biological integrity of the nation's waters.

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[12] National Marine Fisheries Service, Steelhead Conservation Efforts, A Supplement to the Notice of Determination for West Coast Steelhead Under the Endangered Species Act, August, 1996.

The FWPCA also establishes a national policy on technology-based effluent standards and limitations and discharge water quality standards. The Environmental Protection Agency (EPA) has been given principle responsibility for administering the FWPCA.

All entities are presently regulated as to the amount of a pollutant that a point source can discharge into the water. The FWPCA requires that all discharges comply with minimum effluent limitations or standards. These requirements presently affect all of the entities considered in this analysis. In January 1998, President Clinton announced a major new clean water initiative designed to speed the restoration of water quality within the nation's watersheds. This new initiative (to be administered by the EPA) will increase the Federal government's support to states in carrying out a watershed approach to clean water. Included within this new initiative will be more stringent requirements regarding water runoff from Federal lands and incentives for private landowners, including providing technical assistance in reducing polluted runoff from agricultural, range, and forest lands.

The Federal CWA is intended to protect beneficial uses, including fishery resources. To date, implementation has not been effective in adequately protecting fishery resources, particularly with respect to non-point sources of pollution. Still, the CWA is part of the baseline scenario, and compliance is assumed for the purpose of considering the impacts of the 4(d).

Section 303(d)(1) (C) and (D) of the CWA requires states to prepare Total Maximum Daily Loads (TMDLs) for all water bodies that do not meet state water quality standards. If a state fails in this responsibility, EPA is required to do so. TMDLs are a method for quantitative assessment of environmental problems in a watershed and identifying pollution reductions needed to protect drinking water, aquatic life, recreation, and other use of rivers, lakes, and streams. TMDLs may address all pollution sources including point sources such as sewage or industrial plant discharges, and non-point discharges such as runoff from roads, farm fields, and forests. State agencies in Oregon are committed to completing TMDLs for coastal drainages within 4 years and all impaired waters within 10 years. Similarly ambitious schedules are in place or in development for Washington.

The ability of these TMDLs to protect salmonids should be significant in the long term. However, it will be difficult to develop them quickly in the short term and their efficacy in protecting salmonid habitat will be unknown for years to come.

7. EQIP, CRP, WRP, and WHIP

Impacts on entities may be mitigated somewhat by four USDA Natural Resource Conservation Service programs. The Wetlands Reserve Program (WRP), Conservation Reserve Program (CRP), Environmental Quality Incentives Program (EQIP), and Wildlife Habitat Incentives Program (WHIP) all target landowners who bear costs when improving their land for an environmental objective. These programs potentially share costs of moving to best management practices (BMP's), and provide rental monies for easements. Budgets for these programs are limited however, and it cannot be assumed they are guaranteed to be available to all landowners bearing costs.

State Conservation Measures

Various conservation plans and protective measures relevant to the seven ESUs have been implemented at state and local levels. While several of the plans addressed show promise for ameliorating risks facing a variety of salmonids, some of the measures have not been implemented. Many of these measures are also geographically limited to individual river basins or political subdivisions, thereby improving conditions for only a small portion of the entire ESU. To the extent possible, this analysis considers existing state and local protective measures as part of the baseline, and excludes their effects from the analysis. However, conservation plans and measures which are developed in response to the take guidelines of this 4(d) rule can be considered part of the effect of the 4(d) rule.

1. Oregon Conservation Measures

a. Forest Practices Act

The Oregon Forest Practices Act (FPA) was passed in the state legislature in 1971, and has undergone two major revisions in 1986 and in 1991. This act regulates forest operations on private and state lands, and sets standards for reforestation, stream protection, tree retention for wildlife habitat, and protection of scenic corridors. The Board of Forestry enforces the FPA, including through civil penalties. Although modified in 1995 and improved over the previous OFPA, the FPA's implementing rules do not yet adequately protect salmonid habitat. In particular, the current OFPA does not provide adequate protection for the production and introduction of LWD to medium, small and non-fish bearing streams. Small non-fish bearing streams are vitally important to the quality of downstream habitats. These streams carry water, sediment, nutrients, and LWD from upper portions of the watershed. Nonetheless, compliance with the FPA does provide many important protections for salmonid habitat.

b. Agricultural Water Quality Management Practices

Agricultural activity has had multiple and often severe impacts on salmonid habitat. These impacts include depletion of needed flows by irrigation withdrawals; blocking of fish passage by diversion or other structures; destruction of riparian vegetation and bank stability by grazing or cultivation practices; and channelization resulting in loss of side channel and wetland-related habitat (NMFS, 1996b). Historically, the impacts to fish habitat from agricultural practices have not been closely regulated.

The Oregon Department of Agriculture has recently completed guidance for development of agricultural water quality management plans (AWQMPs) (as enacted by State Senate Bill 1010). The guidance focuses on achieving state water quality standards. It is undetermined, however, whether they will adequately address salmonid habitat factors, such as properly functioning riparian conditions. Their ability to address all relevant factors will depend on the manner in which they are implemented. AWQMPs are anticipated to be developed at a basin scale and will include regulatory authority and enforcement provisions. The Healthy Streams Partnership schedules adoption of AWQMPs for all impaired waters by 2001.

c. Oregon Plan for Salmon and Watersheds

In April 1996, the Governor of Oregon completed and submitted to NMFS a comprehensive conservation plan directed specifically at coho salmon stocks on the Coast of Oregon. This plan, termed the Oregon Plan for Salmon and Watersheds (OPSW) (formerly known as the Oregon Coastal Salmon Restoration Initiative) was later expanded to include conservation measures for other stocks (Oregon, 1998). Among other things, Oregon has committed to many measures that will contribute to improved water quality, water quantity and physical habitat for all salmonids.

d. Willamette Restoration Initiative (WRI)

Protecting and restoring fish and wildlife habitat and population levels in the Willamette River Basin, promoting proper floodplain management, and enhancing water quality is the focus of the recently formed Willamette Restoration Initiative (WRI). The WRI creates a mechanism through which residents of the basin are mounting a concerted, collaborative effort to restore watershed health. In addition, habitat protection and improved water quality in the Portland/Vancouver metropolitan areas are getting unprecedented attention from local jurisdictions. The regional government, Metro, recently adopted an aggressive stream and floodplain protection ordinance designed to protect functions and values of floodplains, and natural stream and adjacent vegetated corridors. All jurisdictions in the region must amend their land use plans and implementing ordinances to comply with the Metro ordinance within 18 months. Metro also has a green spaces acquisition program that addresses regional biodiversity, and is giving protection to significant amounts of land, some of it on tributaries to the Willamette River. The city of Portland has identified those activities which impact salmonids and is now using that information to reduce impacts of existing programs and to identify potential enhancement actions. The city will shortly be making significant improvements in its storm water management program, a key to reducing impacts on salmonid habitat.

e. Other Activities

Habitat protection and improved water quality in the Portland/Vancouver metropolitan areas are getting unprecedented attention from local jurisdictions. The regional government, Metro, recently adopted an aggressive stream and floodplain protection ordinance designed to protect functions and values of floodplains, and natural stream and adjacent vegetated corridors. All jurisdictions in the region must amend their land use plans and implementing ordinances to comply with the Metro ordinance within 18 months. Metro also has a green spaces acquisition program that addresses regional biodiversity, and is giving protection to significant amounts of land, some of it on the Sandy River or on tributaries to the Willamette River. The city of Portland has identified those activities which impact salmonids and is now using that information to reduce impacts of existing programs and to identify potential enhancement actions. The city will shortly be making significant improvements in its storm water management program, a key to reducing impacts on salmonid habitat.

2. Washington Conservation Measures

a. Lower Columbia Steelhead Conservation Initiative (LCSCI)

The State of Washington is currently in the process of developing a statewide strategy to protect and restore wild steelhead and other salmon and trout species. In May 1997 Governor Gary

Locke and other state officials created a Joint Natural Resources Cabinet (Joint Cabinet) consisting of state agency directors from a wide variety of agencies whose activities and constituents influence Washington's natural resources. The goal of the Joint Cabinet is to restore healthy salmon, steelhead, and trout populations by improving those habitats on which the fish rely. The Joint Cabinet's current activities include development of the LCSCI, intended to comprehensively address protection and recovery of salmonids in the Lower Columbia River area. In conjunction with the LCSCI process, industry in the Lower Columbia River Chinook ESU sponsored the review and assessment of existing conservation programs in this region (Cramer, 1997). This assessment provided a helpful summary of measures, which if fully implemented and funded, may aid in conserving salmonids in this region.

The LCSCI area includes all of Washington's stocks in the Lower Columbia River ESU. When completed, conservation and restoration efforts in the LCSCI area will form a comprehensive, coordinated, and timely protection and rebuilding framework. Benefits to salmonids in the LCSCI area will also accrue due to the growing bi-state partnership with Oregon.

b. Watershed Management Initiatives

The Legislature passed, and Governor Locke signed into law, the Watershed Management Act (ESHB 2514), which provides funding and a planning framework for locally based watershed management. Depending on how selected local governments and water utilities within a watershed decide to use the planning framework provided in ESHB 2514 (i.e., addressing water quality and habitat as well as water quantity), these watershed plans may have an important connection to specific salmon preservation and restoration activities and overall regional salmon recovery initiatives.

The Legislature also passed, and the Governor signed, the Salmon Recovery Planning Act (ESHB 2496), which provides funding and a procedural framework for prioritizing salmon restoration projects within specified areas agreed to by participating county, city, and tribal governments. These restoration efforts will be important components of watershed and regional salmon recovery initiatives.

c. Washington Forest Practice Rules

The Washington Department of Natural Resources implements and enforces the State of Washington's forest practice rules (WFPRs) which are promulgated through the Forest Practices Board. These WFPRs contain provisions that can be protective of salmonids if fully implemented. This is possible given that the WFPR's are based on adaptive management of forest lands through watershed analysis, development of site-specific land management prescriptions, and monitoring. Watershed Analysis prescriptions can exceed WFPR minimums for stream and riparian protection. However, NMFS believes the WFPRs, including watershed analysis, do not provide properly functioning riparian and instream habitats. Specifically, the base WFPRs do not adequately address large woody debris recruitment, tree retention to maintain stream bank integrity and channel networks within floodplains, and chronic and episodic inputs of coarse and fine sediment that maintain habitats that are properly functioning for all life stages of salmonids.

d. Agricultural Water Policy

Washington has not historically regulated impacts of agricultural activity on fish habitat overall, although there are some special requirements in the Puget Sound area, and Department of Ecology is currently giving close attention to impacts from dairy operations. As in Oregon, development of Total Maximum Daily Loads (TMDLs; see earlier discussion) should improve water quality over the long term; the extent to which other habitat impacts will be ameliorated is unknown.

e. Wild Salmonid Policy

Washington has adopted a Wild Salmonid Policy, designed to limit hatchery influences on natural, indigenous salmonids.

f. Tribal Conservation Measures

A recovery planning group composed of the Makah and Quileute Indian Tribes, the National Parks Service, and Washington Department of Fisheries and Wildlife has recently initiated a collaborative planning effort to determine how to increase the abundance of naturally spawning Ozette Lake sockeye salmon to historic and self-sustaining population levels. NMFS and FWS will assist this effort, and other state agencies and interested parties will be invited to participate. The Makah Tribe, which has operated a supplementation program in Ozette Lake since the early 1980s, is contributing a draft supplementation plan as a starting point for the planning group.

While NMFS recognizes that many of the ongoing protective efforts are likely to promote the conservation of Ozette Lake sockeye salmon and other salmonids, some are very recent and few address conservation at a scale that is adequate to protect and conserve the Ozette Lake ESU. NMFS concludes that existing protective efforts are inadequate to preclude a listing for this ESU, and therefore the 4(d) rule will provide the additional regulatory requirements needed. However, NMFS will continue to encourage these and future protective efforts and will work with Federal, state, and tribal fisheries managers to evaluate, promote, and improve efforts to conserve sockeye and other salmon populations.

X. Reporting, Record Keeping, and Other Compliance Requirements

This rule does not require any reporting, record keeping or other specific actions by non-Federal agencies, organizations, or private individuals. Rather it is the responsibility of individuals, agencies, and organizations not to "take" endangered or threatened species, once the take prohibitions are in place. NMFS provides guidance and technical support to help state and local agencies develop incentive, regulatory, or other programs that avoid or minimize take and effectively promote restoration of the listed population. Some programs for which NMFS has found it not necessary to prohibit take involve record keeping and/or reporting to support that continuing determination. NMFS has attempted to minimize any burden associated with programs for which the take prohibitions are not enacted.

XI. Federal Rules which Duplicate, Overlap, or Conflict with Proposed Rule

The NMFS is not aware of any rules which overlap, conflict or duplicate the proposed 4(d) rule governing "take" of salmonids.

XII. Alternatives to the Rule

NMFS has carefully considered whether any legally supportable options for a 4(d) rule might have less impact on small entities. That consideration was taken in the context of NMFS' statutory obligation to promulgate whatever protective regulations are necessary and advisable to provide for the conservation of the salmonid ESUs. The "take" prohibitions, which are the backbone of this rule, essentially constitute a performance standard; the rule does not include specific, prescriptive steps that must be taken by any particular entity.

For the seven threatened salmonid ESUs, NMFS proposes to apply the take prohibitions enumerated in §9(a)(1) of the ESA. These prohibitions would apply to all categories of activities affecting threatened salmonids in those ESUs, except with respect to specified categories of activities that contribute to conserving listed salmonids or are governed by a program that limits impacts on listed salmonids to an extent that makes additional protection through federal regulation unnecessary.

In formulating this proposed rule, NMFS considered several alternative approaches. First, The U.S. Fish and Wildlife Service (USFWS) has a "global" protective regulation for threatened species, through which § 9 take prohibitions are applied automatically to all USFWS threatened species at the time of listing, unless the USFWS opts to provide a "special rule" for a particular threatened species. NMFS has no such global protective regulation, and hence must promulgate 4(d) regulations deemed necessary and advisable for each threatened species. NMFS has considered developing a similar global protective regulation that would apply to all future threatened species listings. Having global take prohibitions in place would make it difficult for NMFS to subsequently "tailor" the prohibitions on take to better fit circumstances, and could create unnecessary burdens on small entities when and if more tailored protections would suffice to conserve the species.

Second, NMFS could issue 4(d) protective regulations with no limits, or only a few limits, on the application of the take prohibitions for relatively uncontroversial activities such as fish rescue/salvage. For example, when NMFS listed Snake River spring/summer chinook and fall chinook (57 FR 14653, 1992) and Central California Coast coho (61 FR 56149, 1996) as threatened, it concurrently applied § 9 prohibitions to those ESUs, with two exceptions. These were for actions within a § 10 permit or other exceptions of the ESA related to endangered species, and to provide a six month window for continued research while researchers sought a § 10 permit. This approach, again, could mean unnecessary burdens on small entities, if more limited protections would suffice to conserve the species. It would not take advantage of the

opportunity to streamline ESA compliance mechanisms for acceptable activities using the 4(d) mechanism.

Third, NMFS could enact take prohibitions in combination with detailed prescriptive requirements applicable to one or more sectors of activity. For instance, to protect threatened marine turtles, NMFS has required trawlers to be outfitted with turtle excluder devices meeting detailed design parameters. Although prescriptive requirements applicable to one or more economic sectors may become necessary in the future for some or all of these ESUs, it is NMFS' judgment that at present tailored (by limiting application of the prohibitions wherever warranted) application of the take prohibitions will be adequate. The take prohibitions afford greater flexibility to entities to determine how they will avoid taking threatened salmonids, and therefore likely imposes fewer economic burdens than would a series of prescriptive requirements.

Fourth, NMFS could issue 4(d) protective regulations similar to the existing interim 4(d) protective regulations for Southern Oregon/Northern California coast coho published in July, 1997 (62 FR 38479). This regulation includes four additional limitations on the extension of the take prohibitions, for (1) harvest plans, (2) hatchery plans, (3) scientific research, and (4) habitat restoration projects, when in conformance with specified criteria. While this is a perfectly viable alternative, it would not give ESA recognition to several programs that provide sufficient protections for the listed salmonids such that Federal protections are not necessary. It would not take full advantage of the opportunity to streamline ESA compliance mechanisms for acceptable activities using the 4(d) mechanism.

Fifth, (the proposed rule approach) NMFS could issue a limited 4(d) protective regulation as in the interim rule, but with recognition of more programs and circumstances in which application of take prohibitions is not necessary and advisable. That is the approach taken in this proposed rule, which limits the take prohibitions for the seven items discussed above, but would also limit application of the take prohibitions for (1) properly screened water diversions; (2) in Oregon, for routine road maintenance by ODOT and possibly cities and counties; (3) for the integrated pest management of the Portland Parks and Recreation Department; (4) for urban density development activities, and (5) for forest management (including timber harvest) in Washington conducted in accordance with requirements of the State's Forests and Fish Report. For several of these categories (harvest, artificial propagation, habitat restoration, and urban development) the regulation is structured so that it allows plans or programs developed after promulgation of the rule to be submitted to NMFS for review under the criteria in the rule. Those programs which meet the proposed criteria would not be subject to the prohibitions on take. This approach would allow programs which are under development at the time of this rulemaking, or new programs within these categories, to be included later.

Sixth, NMFS considered an option earlier advocated by the State of Oregon and others, in which § 9 take prohibitions would not be applied to any activity addressed by the Oregon Plan for Salmon and Watersheds, fundamentally deferring protections to the state. At present, NMFS concludes that doing so would not provide sufficient protections to the listed salmonids. In this

rule NMFS proposed not applying the take prohibitions to any sector of activity for which other mechanisms currently provide adequate protection for salmonids and their habitat. NMFS will continue to actively seek to identify any additional categories of activity that are managed or regulated in a way that conserves salmonids. NMFS will give equivalent recognition to other sectors or geographic areas through appropriate Endangered Species Act mechanisms whenever the facts warrant.

Finally, NMFS considered, but rejected, the alternative of enacting no protective regulations for threatened salmonids. That course would leave the ESUs without any protection other than provided by § 7 consultations for actions with some federal nexus. By virtue of the findings upon which the decision to list the ESUs as threatened, identifying broad segments of human activity as major factors in the decline of these salmonid ESUs, NMFS could not support that approach at this time as being consistent with the obligation to enact such protective regulations as are "necessary and advisable to provide for the conservation of" the listed salmonids.

NMFS concludes that at the present time there are no legally viable alternative rules that would have less impact on small entities and still fulfill the agency's obligations to protect listed salmonids.

XIII. Economic Mitigation and Sources of Aid to Small Businesses

In addition to the EQIP, CRP, WRP, and WHIP programs, discussed above, there are many other programs including privately funded programs that small business entities could take advantage of. A very good starting point for finding out about these programs can be found at the following web site: *http://www.4sos.org/*. This the web site for "For the Sake of Salmon" Organization which provides links that provide information on watersheds and advice on watershed restoration and improving water quality. Information on grants, funding sources and an extensive list of funding programs offered by Federal and state governments and private foundations. Links to specific agencies and organizations with funding sites on the web are provided including links to Federal, tribal, state, and local government organizations.
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